APR 29 [illegible]

I 29.2:Sa 3/4/draft

SALEM MARITIME

NATIONAL HISTORIC SITE

SITE PLAN · ENVIRONMENTAL ASSESSMENT

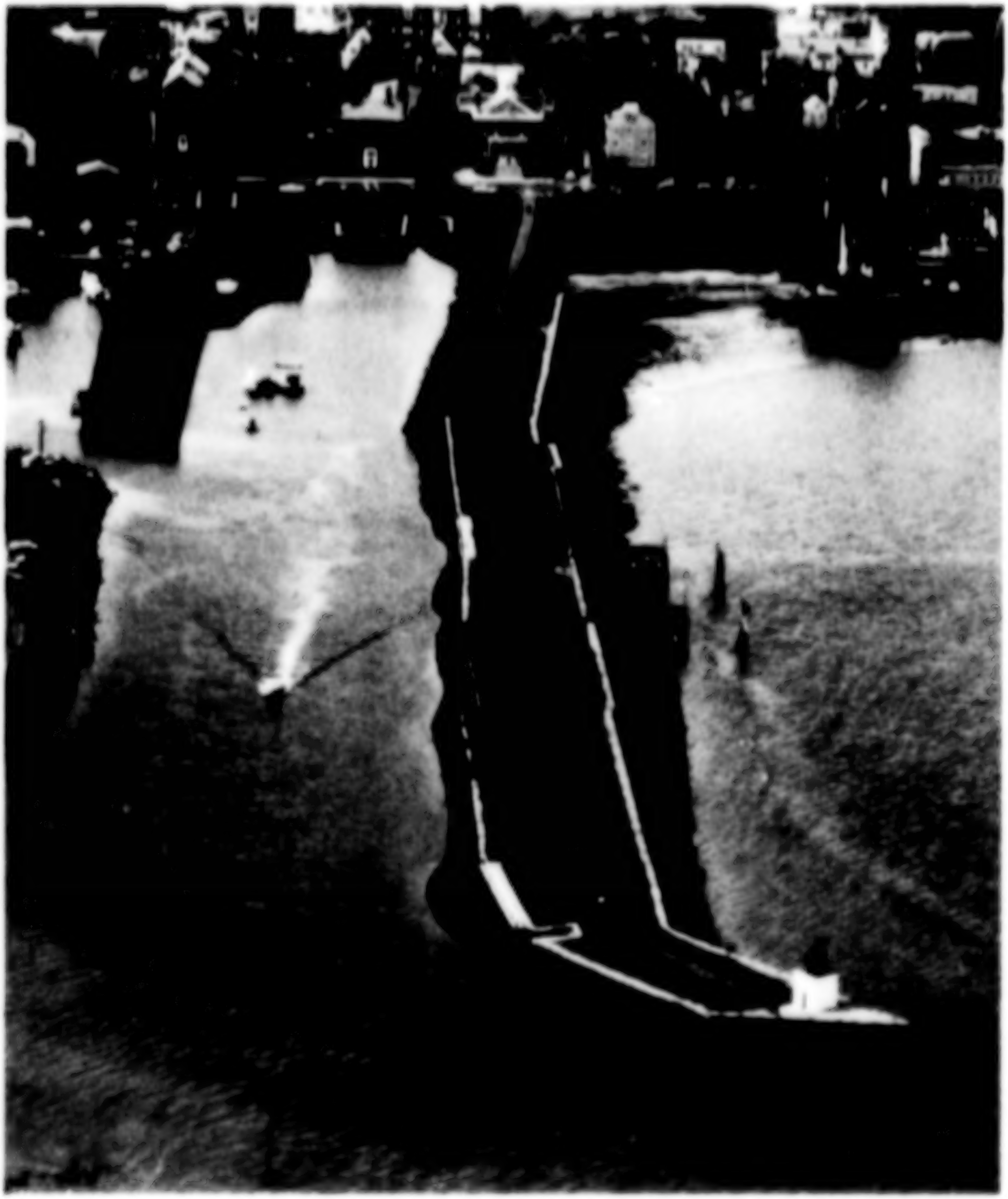
TK

SALEM MARITIME

NATIONAL HISTORIC SITE / MASSACHUSETTS
SITE PLAN • ENVIRONMENTAL ASSESSMENT

DRAFT • APRIL 1991

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE



SUMMARY

The National Park Service is considering alternative site development plans for Salem Maritime National Historic Site. The *Site Plan* will update and implement the current *Master Plan*, which was approved in 1978. The major planning goals are to revitalize the site, rehabilitate the deteriorating historic wharves, provide adequate maintenance facilities, and integrate the site with the city of Salem and related resources. The vision for the park is to capture the spirit of the maritime era. More attention will be focused on the wharves and harbor, which were the major focus of maritime activity. The buildings north of the wharves, which are the park's most intact historic resources, will be strongly linked to the wharves. Park use and development will create an overall image of maritime history in which visitors can gain a sense of the vibrant energy and excitement that marked the height of the maritime era. Modern uses should be relegated to the edges of the site where they do not intrude on the historic maritime scene. Four alternatives are under consideration.

Alternative 1, no action, would retain the existing site development. The wharves would be rehabilitated as necessary to ensure their long-term preservation. The wharves would be interpreted through existing waysides and guided tours, and the historic buildings north of Derby Street would be interpreted through tours and new exhibits being prepared under the 1990 *Interpretive Prospectus*.

This alternative would ensure the long-term preservation of significant resources and avoid any adverse impacts on the cultural or natural environments. The visitor experience would remain focused on the form and functions of the buildings north of Derby Street with little sense of the maritime activities that occurred on the wharves.

Alternative 2 would greatly expand the visitor experience and create a strong visual and interpretive link with the historic structures north of Derby Street by adding form and functions to the wharves and harbor. A lively, active, and participatory maritime atmosphere would be created by adding complete and partially enclosed warehouses, a reconstructed period vessel, a shipbuilding exhibit, and visiting wooden sailing vessels at the site. The wharves would be rehabilitated, and the new structures and vessels would allow visitors to use all their senses to experience how the warehouses, wharves, and vessels looked, felt, and smelled during the height of the maritime era. The historic structures north of the wharves would be preserved and used to create a more complete and unified picture of the site's history by illustrating the character and lives of the city's residents and how activities at the site contributed to the growth of the nation. Ample open space would remain at the site for spontaneous play and relaxation.

The presence of a reconstructed period vessel, visiting wooden sailing ships, and warehouse structures would increase visitation to Salem's waterfront and, in addition to enhancing visitors' understanding and appreciation of history, would provide economic benefits to tourism-related businesses in that area and probably throughout much of the city as well. The site's inner harbor would be dredged to make it accessible to these vessels. Dredging would cause localized, short-term increases in sedimentation in harbor waters adjacent to the wharves. However, no benthic organisms, fin fisheries, or shellfish beds would be adversely affected. Disposal of dredged materials would be in compliance with all state and federal requirements and would not adversely affect marine or terrestrial resources. Previous dredging has already disturbed underwater archeological resources adjacent to the wharves. The project would be monitored by an archeologist and any resources encountered would be salvaged.

The more modern edge of the site would accommodate day-use boat docking and a tour boat drop-off.

New development on the wharves would be within the 100-year floodplain and would require a statement of findings.

Alternative 3 would reorient the visitor experience by focusing people's attention on all the site's surviving historic structures, including the wharves. A better sense of historic waterfront activities on the wharves would be provided through large waysides, demonstrations inviting visitor participation, audio tours, and increased interpretive tours. This would provide a visitor experience focused less on the form and functions of warehouses, vessels, and wharves and more on the kinds of images of maritime life experiences that could be evoked by the audio programs and the demonstrations.

No dredging would occur under this alternative. The harbor between the wharves would be inaccessible to vessels. Without the presence of ships and structures, the wharves would not be expected to draw as many visitors to the waterfront as would occur under other alternatives, and some visitors might find it difficult to translate the two-dimensional images into three-dimensional form. The wharves would remain visually subordinate to the historic structures north of Derby Street. Development in the floodplain would be minimal.

Facilities for day-use boat docking and a tour boat drop-off would be similar to those described for alternative 2.

Alternative 4, like alternative 2, would add the form and functions of vessels and warehouses to the site, but primarily in a museum on Derby Wharf. Placing major vessel and warehouse exhibits indoors would avoid some dredging and problems of maintaining a vessel in the water, and it would provide greater opportunities to compare different kinds of vessels. However, the experience might not equal the chance to board and experience a reconstructed period ship. Also the museum might duplicate some of the experiences available at other museums in the area. Wooden sailing vessels would be encouraged to visit the site, as in alternative 2, and site design elements in the water would provide a visual impression of a harbor filled with ships. Dredging for visiting vessels but not for a permanent reconstructed ship would reduce the amount of sediment disturbance and disposal by about one-third, compared to alternative 2.

The presence of a major museum on Derby Wharf, supplemented by a visual impression of ships and changing opportunities to see visiting vessels, would increase visitation to Salem's waterfront, as in alternative 2. Since the museum would need to be larger than the historic wharf warehouses to allow for major indoor ship exhibits, it might visually overwhelm the existing historic resources, and it would be a nonhistoric-appearing intrusion on views from several locations.

Considerably more day-use docks for recreational boats would be provided on both Central and Derby wharves. People with boats would welcome this additional docking. However, the docks on Derby Wharf would be a visual intrusion on a significant historic resource and key interpretive area and further constrict channel use. Activities associated with recreational boating would conflict with the primary interpretive purpose of the site.

In **alternatives 2, 3, and 4** parking would be relocated to a downtown garage, and visitors would be directed first to a downtown visitor center, then to the national historic site. Shuttle buses would provide transportation from the parking lot to the site. In alternative 4 only, a visitor parking lot would also be retained on Central Wharf.

Some on-street parking spaces inside the national historic site boundary would be closed during the daytime, and replacement parking for neighborhood residents would be provided nearby. Neighborhood residents would benefit from additional parking and less visitor traffic on local streets, but they would have to walk several blocks to the new parking lot.

A new maintenance facility would be developed off the site. Three locations are being considered for this facility: one on Blaney Street, one on Essex Street, and one at Fort Avenue and Prusak Square. Additional site analysis would be required prior to development of this facility.

CONTENTS

SUMMARY iii

PART ONE: INTRODUCTION 1

SIGNIFICANCE OF SALEM MARITIME NATIONAL HISTORIC SITE 3
PLANNING BACKGROUND 3
SITE PLAN PURPOSE AND GOALS 4
    Site Revitalization 4
    Wharf Stabilization 6
    Integration with the City of Salem and Related Resources 6
    Provision of Maintenance Facilities 7
SITE ANALYSIS 7
    Cultural Resources 8
    Scenic Resources 8
    Natural Resources 9
    Recreational Resources 9
    Park Identity 9
    Access and Circulation 10
    Surrounding Land Use 10
THE VISION FOR SALEM MARITIME NATIONAL HISTORIC SITE 17
INTERPRETIVE THEMES 18
    Maritime Trade 18
    Vessels and Life at Sea 19
    Character of the People 19
    Evolution of the Site 20

PART TWO: ALTERNATIVES 21

ALTERNATIVE 1: NO ACTION 23
    Access and Circulation 23
    Orientation and Support Facilities 23
    Interpretive Media and Programs 23
    Recreation 24
    Wharf Rehabilitation and Dredging 24
    Maintenance Facilities 24
ALTERNATIVE 2: THREE-DIMENSIONAL INTERPRETIVE FORM 24
    Access and Circulation 26
    Orientation and Support Facilities 26
    Interpretive Media and Programs 27
    Recreation 38
    Wharf Rehabilitation and Dredging 38
    Maintenance Facilities 38
ALTERNATIVE 3: LOW-PROFILE INTERPRETIVE MEDIA 38
    Access and Circulation 39
    Orientation and Support Facilities 39
    Interpretive Media and Programs 44
    Recreation 44
    Wharf Rehabilitation and Dredging 44
    Maintenance Facilities 44

ALTERNATIVE 4: MUSEUM/RECREATIONAL USE 44
  Access and Circulation 45
  Orientation and Support Facilities 45
  Interpretive Media and Programs 53
  Recreation 53
  Wharf Rehabilitation and Dredging 53
  Maintenance Facilities 53
ALTERNATIVES CONSIDERED BUT REJECTED 57
  Alternatives for Vessel Interpretation 57
  Alternative Parking Sites 57
  Alternative Maintenance Sites 57

PART THREE: DESCRIPTION OF THE ENVIRONMENT 61

CULTURAL ENVIRONMENT 63
  The Wharves 63
  Derby Street 64
  North Area 65
  Vessels 66
NATURAL ENVIRONMENT 67
  Marine Environment 67
  Terrestrial Environment/Floodplains and Wetlands 73
  Threatened and Endangered Species 74
  Climate and Air Quality 74
SOCIOECONOMIC ENVIRONMENT 75
  Visitor Use 75
  Transportation and Parking 75
  Salem's Economy and Tourism 77
POSSIBLE MAINTENANCE SITES OUTSIDE THE BOUNDARY 78
  Property on Blaney Street East of the Historic Site 78
  Old East Branch Library on Essex Street 78
  City-Owned Property at Fort Avenue and Prusak Square 79
  Garage on Derby Street 79

PART FOUR: ENVIRONMENTAL IMPACTS 81

CULTURAL ENVIRONMENT 83
  General 83
  Alternative 1: No Action 83
  Alternative 2: Three-Dimensional Interpretive Form 84
  Alternative 3: Low-Profile Interpretive Media 87
  Alternative 4: Museum/Recreational Use 88
NATURAL ENVIRONMENT 89
  Alternative 1: No Action 89
  Alternative 2: Three-Dimensional Interpretive Form 90
  Alternative 3: Low-Profile Interpretive Media 93
  Alternative 4: Museum/Recreational Use 93

SOCIOECONOMIC ENVIRONMENT 94
  Alternative 1: No Action 94
  Alternative 2: Three-Dimensional Interpretive Form 94
  Alternative 3: Low-Profile Interpretive Media 98
  Alternative 4: Museum/Recreational Use 98

COMPLIANCE WITH FEDERAL AND STATE LEGISLATION AND POLICIES 101

APPENDIXES 105

APPENDIX A: COST ESTIMATES 107

APPENDIX B: TEST DATA RELATING TO ENVIRONMENTAL QUALITY 115

APPENDIX C: ACTIONS REQUIRING FURTHER CONSULTATION UNDER SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT 122

BIBLIOGRAPHY 125

STUDY TEAM, CONSULTANTS, AND CONTACTS 128

MAPS

City Context 11
Existing Structures 13
Site Analysis 15
Proposed Transportation and Off-Site Facilities 29
Alternative 2: Three-Dimensional Interpretive Form 31
Alternative 3: Low-Profile Interpretive Media 41
Alternative 4: Museum/Recreational Use 47
Potential Maintenance Facilities 59
Natural Resources 69
Site Bathymetry 71

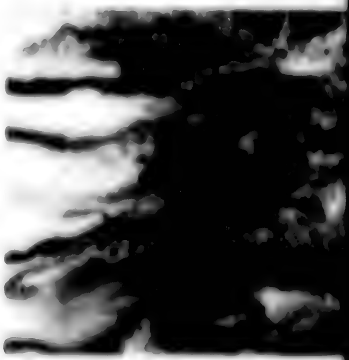
TABLES

Table 1: Summary Comparison of Alternatives 54
Table 2: Annual Site Visitation, 1985-89 75
Table 3: Hourly Peak Day Traffic Demand (August Weekend Day) 76

ILLUSTRATIONS

Alternative 2: Three-Dimensional Interpretive Form 28
Derby Wharf Interpretive Area 33
Reconstructed Vessel 34
Optional Schemes for New Warehouse and Ghosted Buildings 35
Optional Warehouse Perspectives 36
Shipbuilding/Repair Exhibit Area 37
Alternative 3: Low-Profile Interpretive Media 40
Large Wayside Exhibit 43
Alternative 4: Museum/Recreational Use 46
Derby Wharf Museum 49
Derby Wharf Section 50
Derby Wharf Day Use Docks 51
Ghosted Vessels and Vessel Deck 52

■ PART ONE: INTRODUCTION



INTRODUCTION

SIGNIFICANCE OF SALEM MARITIME NATIONAL HISTORIC SITE

Salem Maritime was the country's first national historic site. Situated along the harbor in Salem, Massachusetts, it is the best remaining representation of early American maritime activities and their significant contributions to the founding and development of the United States. Spanning a period of three centuries, the story of maritime Salem is a stirring saga of enterprising and daring Yankee sea captains, privateers, and merchants. Compelled to seek their livelihood from the sea, they transformed a tiny, isolated settlement into a rich and powerful world port, helped to win and sustain American independence, and ultimately helped finance and supply America's industrial revolution. The national historic site encompasses about 9 acres at the center of what was once the main waterfront section of the city. The principal resources include three reconstructed historic wharves extending into Salem Harbor and backed by a row of government, residential, and commercial structures, including the historic Custom House, elegant homes of sea captains and merchants, and the more ordinary home of craftsmen. The purpose of the site, as mandated by Congress, is to "preserve for public use...certain lands and structures... by reason of their relationship to the maritime history of New England and the United States."

The significance of the site to the nation's history relates to the impact of Salem's privateering and the maritime trade, which reached its height at the strategic time when the United States was emerging as a nation. During the Revolutionary War and the War of 1812, Salem privateers sorely harassed enemy shipping and kept critical supply routes open, greatly aiding the cause of independence. Between the two wars and after, the lucrative global trade conducted by Salem merchants brought vitally important revenues into the federal treasury. Indeed, without these revenues it is hard to imagine how the new government could have survived financially. Through their contact with foreign ports and peoples the merchants of Salem and her sister ports brought an international prestige to the fledgling nation.

Salem's golden age of maritime trade made this site unique in American history, but other periods of the site's history are also significant as part of a comprehensive story. Salem's foreign trade evolved out of the early settlers' fishing and trading enterprises, disrupted and reoriented by the war. And the capital amassed through maritime trade contributed to the beginning of America's industrial revolution.

PLANNING BACKGROUND

For more than a decade the National Park Service has envisioned bringing the Salem Maritime site back to life as the foremost place where Americans can come to appreciate the significance of maritime enterprise to our national heritage. The current *Master Plan* for the site, approved in 1978, proposes that the wharves, buildings, museum collections, and grounds be managed and developed where necessary to provide a setting that will transport people in spirit back to the time when Salem was a bustling international seaport. This *Site Plan* is a continuation of that planning for the national historic site.

SITE PLAN PURPOSE AND GOALS

This *Site Plan* addresses the development of Salem Maritime National Historic Site needed to implement the 1978 *Master Plan*. Because of the amount of time elapsed since the approval of the *Master Plan*, some of the elements need to be updated. For example, since the 1978 plan was approved, Congress has directed planning for a new initiative, called the Salem Project, a partnership of public and private entities created to coordinate the preservation and interpretation of a variety of closely related sites that can enhance the story to be told at Salem Maritime. The alternatives incorporate this new perspective on Salem Maritime National Historic Site as a part of the Salem Project. The alternatives also reflect the results of ongoing research, experience gained since 1978 through the operation of this and other sites, and new National Park Service guidelines and policies. The major goals of this plan are as follows.

Site Revitalization

The primary issue addressed by the 1978 *Master Plan* was how to give the site a historic seaport feeling and invite visitors to participate in interpretive activities, and this remains the major issue today. Historically, Salem Harbor was alive with fishing boats, coastal schooners, frigates, brigs, and the famous East Indiamen specially designed for Salem's exotic East Indies trade. The wharves were lined with warehouses, and carts and carriages moved people and cargo in seemingly endless processions from land to sea and sea to land. Today the surviving wharves are almost bare, and the tall ships that gave the harbor its distinctive character are gone. The site is currently focused inward, toward a row of historic buildings along Derby Street. Its main maritime assets – the wharves and the harbor – are not being presented to advantage.

The park staff has tried to resolve this problem with waysides, on-grade warehouse outlines, personal interpretation with props, a single warehouse, and a non-period vessel. All of these attempts have been weak in their conception, and none have provided the appropriate sensory experience.

The 1978 *Master Plan* proposed construction of two warehouse exhibit structures on the wharves and reconstruction of a period ship in the harbor to set the stage for interpretation. The intent of this proposal was to create a setting in which visitors could use all of their senses to hear, see, smell, and feel what the Salem waterfront must have been like at the height of the maritime era and to provide opportunities for visitors to participate in the kinds of activities that influenced the growth of the new nation.

The NPS *Management Policies* and *Cultural Resource Management Guidelines* (NPS-28) require that any reconstruction be accomplished with a minimum of conjecture. Adequate documentation exists for reconstruction of a historic vessel, but appropriate data have not been found to support the reconstruction of buildings on Derby Wharf. Recognizing that reconstruction of the buildings is not a feasible option at this time, but assuming that a coordinated plan for the entire park is needed, the National Park Service is reevaluating how the site can best be developed to carry out the intent of the 1978 *Master Plan*. Three alternatives are being considered, in addition to the possibility of taking no action.

Wharf Stabilization

Another major concern of the 1978 *Master Plan* was the preservation of the wharves, particularly Central Wharf, which is badly in need of repair. Central Wharf was rehabilitated in the 1930s. While 20th century technology was used at that time, care was taken to replicate the historic appearance of the wharf. In the 1970s the west side of the wharf was totally reconstructed with steel bulkhead. Although that portion of the wharf remains in good condition, the east side of the wharf has become structurally unsound and could be lost if rehabilitation does not occur in the near future. Current conditions on the wharf pose an immediate safety hazard to visitors. Also the section rehabilitated with steel bulkhead does not match the historic appearance of the rest of the wharf. The determination of how best to rehabilitate the wharf will depend, in part, on the uses it will accommodate; thus, design work for wharf rehabilitation has been phased to coincide with site planning. Derby and Hatch's wharves need minor repair work that will also be coordinated with other site development.

Integration with the City of Salem and Related Resources

The Salem Project, as described in the *Salem Project Study of Alternatives*, is envisioned as a joint venture of governments and private citizens working together to preserve the rich cultural heritage of Salem and related sites in the area. The intent of the project is for private and public property owners and all levels of government to cooperatively pursue the kind of management that will preserve important resources, provide unified interpretation of a nationally significant story, and ultimately enhance the quality of life in the area. The project would be centered around Salem Maritime National Historic Site, recognizing that many aspects of the story to be told at Salem Maritime could be brought to life for visitors more vividly and effectively by coordinating the interpretation of a great variety of related resources inside and outside the historic site boundary.

Within the city of Salem, nine historic districts and additional registered properties create significant and popular sightseeing opportunities for visitors. In anticipation of greater coordination with related city sites in the future, the National Park Service has recently extended its programming outside the boundaries of Salem Maritime National Historic Site by opening an interim visitor center in downtown Salem. Congress has passed legislation authorizing the Park Service to establish a permanent visitor center in the city. The proposed location for this facility is the armory building adjacent to the Essex Street pedestrian mall. Should this site prove infeasible another site would be found in downtown Salem. Most visitors will begin their Salem tour at this downtown visitor center, where a film, orientational exhibits, and publications will place Salem's maritime history into its full historical context. With this background when they arrive at Salem Maritime National Historic Site, visitors will be ready to focus on specific elements of the site's maritime history and its significance to the nation.

The city of Salem is difficult to drive in, parking is a problem, and visitors have trouble finding their way around. The recently completed *Salem Transportation Plan* proposes access and circulation improvements, centralized downtown visitor parking, and shuttle bus and pedestrian systems linking the city's major historic and recreational resources. The plan identifies the East India Square garage as an easily accessible, underutilized parking structure that could work well for visitor parking. As envisioned, the Salem Project would incorporate this proposal for centralized parking and rely heavily on walking tours and on public transportation systems, such as shuttle bus, trolley, train, and tour boat routes, to move visitors from site to site. Consistent with the planning for the Salem Project to date, this *Site Plan* for Salem Maritime National Historic Site assumes a central visitor center will be built and assesses ways of tying into citywide orientation and transportation systems.

Provision of Maintenance Facilities

The 1978 *Master Plan* proposed that the warehouse on Central Wharf be used for visitor orientation and park maintenance. However, this facility is no longer considered adequate to meet site maintenance needs. In fact, this structure has proved barely adequate in size to meet visitor orientation needs, and consequently, maintenance has never been relocated there. Maintenance facilities remain dispersed throughout the site – in the basements of the Custom House and Polish Club and at other locations – where they are highly intrusive and even dangerous to employees, visitors, and significant historic resources, since they involve the storage of paints, solvents, gasoline, and other hazardous substances.

The National Park Service is looking for a suitable maintenance facility outside the boundary of the historic site. Possible locations for this facility have been evaluated as part of this *Site Plan*; however, additional site planning and environmental analysis will be required for the maintenance site. Future planning studies will also be required to address administrative office space and other facilities needed to support park operations. These topics are not included in the scope of this *Site Plan*.

SITE ANALYSIS

This section briefly describes the major site opportunities and constraints. A more detailed description of cultural resources, natural resources, and parking and traffic conditions is provided in the "Description of the Environment" in part three of this document.

Cultural Resources

The portion of the site north of Derby Street contains outstanding examples of architecture from several different periods: The early settlement period is represented by the 1672 Narbonne house. The height of the maritime era is represented by the Custom House/bonded warehouse/scale house complex, the Hawkes house, the Derby house, and the West India Goods Store. The industrial period is represented by the Polish Club. All of these buildings have excellent historical integrity, and some potential for archeological resources remains on the adjacent grounds. The landscaping plan was created by the National Park Service in 1939 and somewhat modified when the Narbonne house was included in the site in the 1970s.

The wharves south of Derby Street represent all of the above-mentioned time periods. The majority of the wharf area has undergone extensive rehabilitation and reconstruction over the years. Derby Wharf, once lined with as many as 22 warehouses and supporting the transport of goods from many vessels, was the largest and most important maritime facility standing in Salem for 75 years. Central Wharf also had numerous warehouses, including the brick Forrester warehouse. All the structures formerly occupying the wharves have been removed, except for a couple of feet of the Forrester warehouse walls. However, the historic form and elevation of the wharves remain, along with much of the 1930s wall, which replicated earlier designs. Some potential for archeological resources may remain in a few portions of the wharves.

No historic ships exist at the site. No regional ships dating from 1760-1830 have survived, and no existing reconstructed ships adequately meet the interpretive needs of the park.

Scenic Resources

The park has three distinctive visual areas: the open expanse of the wharves, harbor, and Derby Street; the enclosed north area; and the modern western edge of Central Wharf. The open wharves, especially Derby Wharf, provide good views of the harbor and also back into the landward portions of the site. The backdrops of these expansive seaward and landward views are critical to people's perceptions of the site. The landward backdrop is dominated by a row of buildings along Derby Street both inside and outside the park boundary. This view still retains considerable historical integrity. The seaward backdrop is open in some directions; however, a large power plant on the shoreline several blocks east of the site is a dominating feature that can be clearly seen from the wharves. Another important view is the view from the Custom House across the wharves and to the harbor. Because of the openness of the wharves, the entire area is exposed, and any structures placed here will be visible in all these views.

The north area has a visual image that is very different from the wharves. The historic residences surround a courtyard area that is fenced off from the neighborhood and provides a shady, enclosed setting with only limited views to the harbor. The old buildings surrounding the courtyard provide a strong historic image. Only the park's modern restrooms, which are located in the middle of the courtyard, are inconsistent and intrude upon the space.

The western edge of Central Wharf serves as the park's modern edge and ties to the modern surrounding land uses. This area has modern intrusions, such as a parking lot, steel bulkhead, modern docking facilities, and modern boats. The entrance to the site on the western edge of Central Wharf is an important viewpoint and provides most visitors with their first impressions of the site.

Natural Resources

Salem Maritime's urban waterfront has been significantly altered from its natural condition. Much of the site south of the Custom House is within the 100-year floodplain. The wharves and beach are battered by periodic flooding, high tides, and strong winds, which create continuous maintenance problems. The only remaining wetlands are inter- tidal flats. A 2.8-acre shellfish flat exists off the northeastern edge of Derby Wharf. The harbor between Derby and Central wharves has silted in and is used by only a few shallow-drafted boats. Use by larger vessels, including those that historically used the harbor, would require dredging. The possibility of dredging in this area raises concerns about the stability of the wharves, stirring up pollutants on the harbor bottom, and disposal of dredge material.

Recreational Resources

Salem Maritime is one of the few public open spaces with access to the water and is an important recreational open space for the surrounding community. The wharves are currently used much like a local city park for activities such as walking, volleyball, picnics, dog walking, and jogging.

Limited day-use docking facilities are provided along the western edge of Central Wharf. Two docks also exist on Derby Wharf; however, both of these are in poor condition, and one has been closed to public use. The other is still open and is infrequently used to tie up dories. Limited mooring facilities for small craft exist between Derby and Central wharves. Existing day-use boat docking facilities near the downtown cannot meet the demand.

Park Identity

The site lacks identity and definition. People often do not know they are within the historic site boundaries. The site is an integral part of the city and is accessible to the public during all hours, and many people visit the site after the park facilities are closed.

The park is physically and visually divided into two distinctive parts. There is a lack of balance between the north area, where historic structures are still standing, and the wharves, which have been cleared of all historic structures and are now mostly grassy open areas. The two parts of the site are separated by Derby Street, which is a heavily traveled modern asphalt thoroughfare. For these reasons the park lacks unity and visitors find it difficult to link the resources.

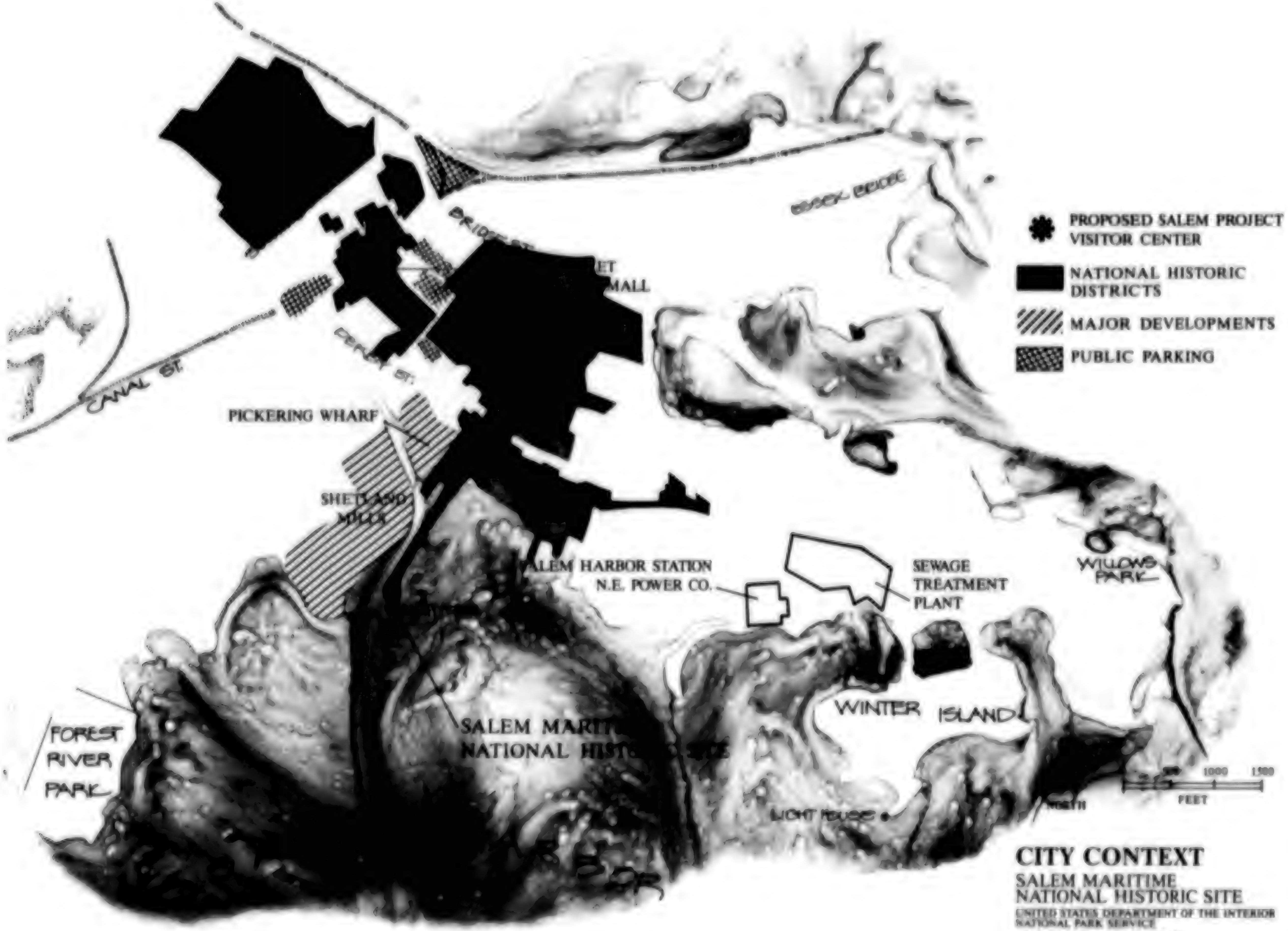
Access and Circulation

Safety problems are caused on Derby Street by a combination of heavy vehicle traffic, on-street parking, large numbers of visitors crossing the street, and tour buses stopping to explain the history of the site.

Visitor parking demand on peak days exceeds the capacity of the site's parking lot. This lot is also heavily used by people who are not park visitors. As a result, some visitors search through the surrounding neighborhood for parking. Parking is a major concern of neighborhood residents. There is little off-street parking, and most neighborhood streets are reserved for residents with parking stickers. Derby Street is one of the few free parking zones in the area, and during the summer months, when tourism is high, visitors and local residents compete for the limited parking in this zone. Finding satisfactory replacement parking will be a prerequisite to altering any existing parking inside the historic site's boundary.

Surrounding Land Use

The neighborhood surrounding Salem Maritime is a medium-density, predominantly residential area with some mixed use. Properties abutting the west side of the park include a complex of shops and restaurants at Pickering Wharf and a large-scale industrial and office complex at the newly renovated Shetland Mills. To the east, the neighborhood becomes increasingly residential, with historic single- and multifamily residences. Many neighborhood structures are integral to the site's maritime history and help provide the backdrop for the wharves. This is particularly true of the Brookhouse Home and the Forrester house.



CITY CONTEXT

SALEM MARITIME
NATIONAL HISTORIC SITE

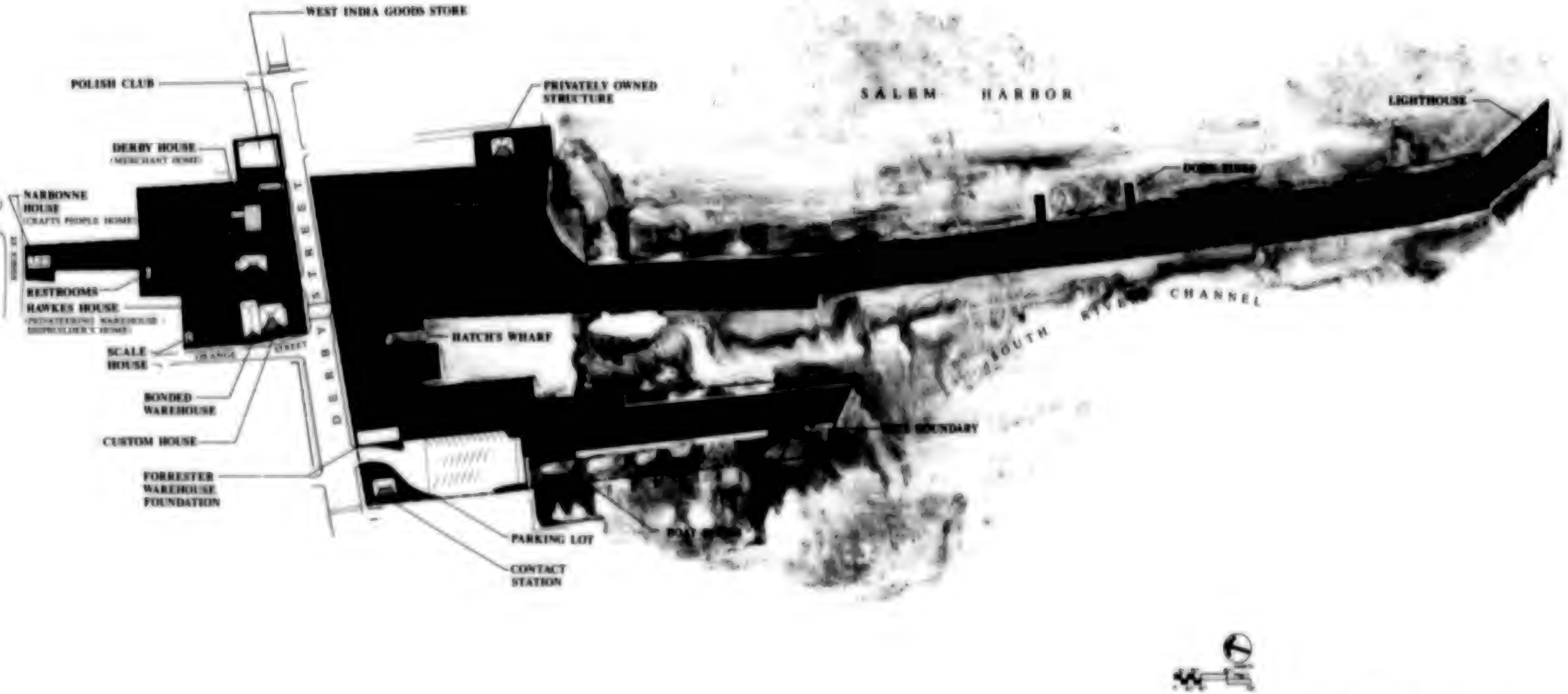
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

373 • 40,023B • DSC • FEB 91

SITE ANALYSIS
SALEM MARITIME NATIONAL HISTORIC SITE

	PHYSICAL CHARACTER	FUNCTIONAL CHARACTER
◠	MAJOR ENTRY	POORLY DEFINED/NO SENSE OF ARRIVAL
◠	SECONDARY ENTRY	POORLY DEFINED/NO SENSE OF ARRIVAL
◪	HISTORIC BUILDINGS AND FRONT YARDS	EXCELLENT INTEGRITY
▭	WAREHOUSE FOUNDATION	POOR INTERPRETIVE QUALITY
✱	EXISTING CONTACT STATION	HIDDEN
■	EXPOSED GRASSY WHARVES	LACK HISTORIC SEAPORT CHARACTER/PORTIONS OF EDGE COLLAPSING
■	ENCLOSED SHADY COURTYARD	QUIET RELAXING SPACE
▨	VISITOR PARKING LOT	UNSCREENED, MOSTLY USED BY OTHERS, WILL NOT MEET FUTURE PARKING DEMAND
⎍	STEEL BULKHEAD	MODERN VISUAL INTRUSION
░	SHALLOW WATER	USE LIMITED TO SHALLOW-DRAFT VESSELS
■	DEEP WATER	USED BY A VARIETY OF BOATS
≈	DOCKS/MOORING	USED BY A MIXTURE OF BOAT TYPES/ MOSTLY MODERN
▬▬	MAJOR STREET	DANGEROUS/SEPARATES PARK AREAS/ MODERN VISUAL INTRUSION
➚	PARKING LOT ENTRY	HIDDEN
●	MAJOR PEDESTRIAN CROSSING	DANGEROUS
<	OPEN VIEWS	GOOD VIEWS OF WHARVES AND HARBOR

*Floodplain and shellfish flat – see Natural Resource map



EXISTING STRUCTURES

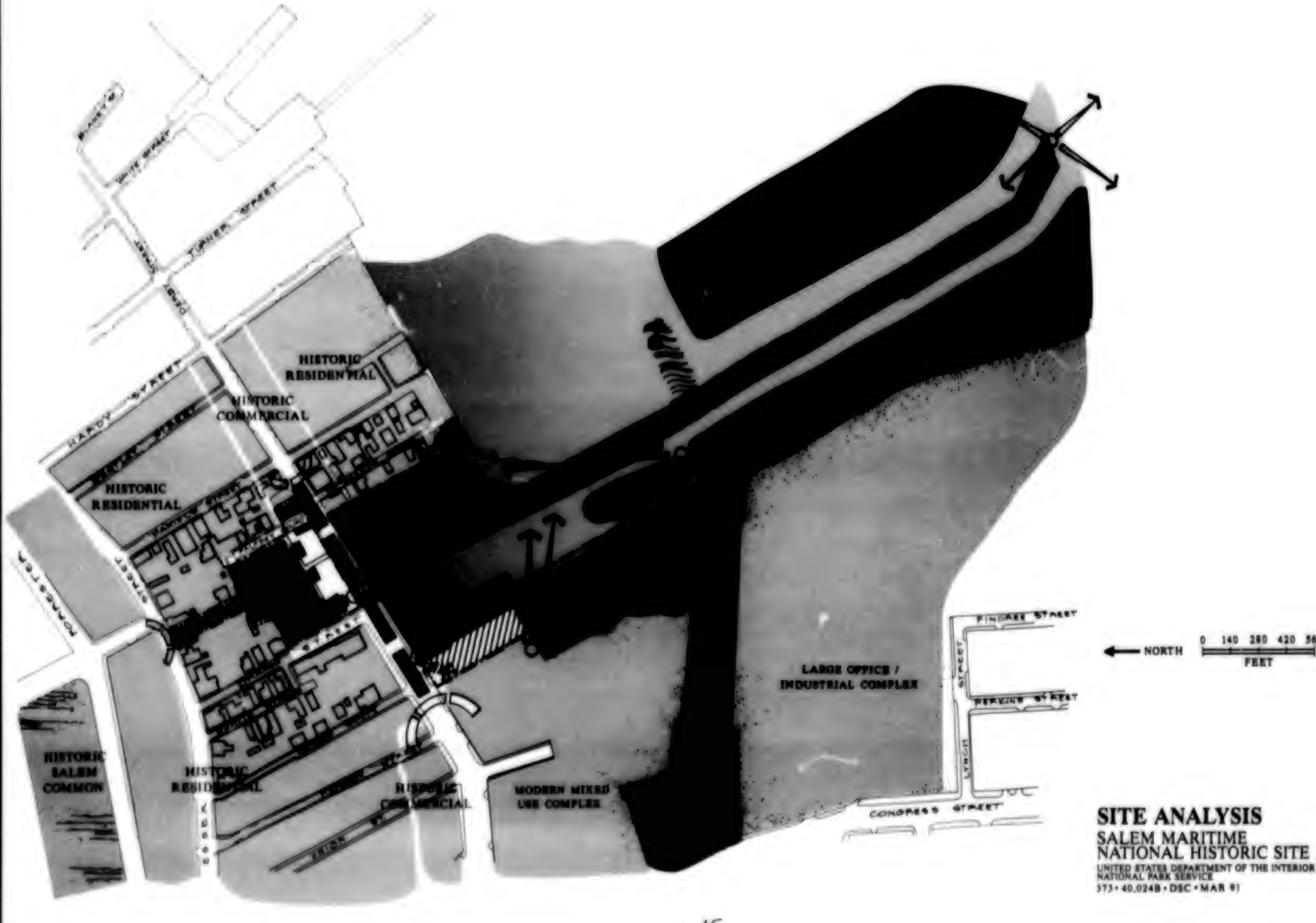
SALEM MARITIME NATIONAL HISTORIC SITE

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

SITE ANALYSIS
SALEM MARITIME NATIONAL HISTORIC SITE

PHYSICAL CHARACTER	FUNCTIONAL CHARACTER
MAJOR ENTRY	POORLY DEFINED/NO SENSE OF ARRIVAL
SECONDARY ENTRY	POORLY DEFINED/NO SENSE OF ARRIVAL
HISTORIC BUILDINGS AND FRONT YARDS	EXCELLENT INTEGRITY
WAREHOUSE FOUNDATION	POOR INTERPRETIVE QUALITY
✱ EXISTING CONTACT STATION	HIDDEN
EXPOSED GRASSY WHARVES	LACK HISTORIC SEAPORT CHARACTER/PORTIONS OF EDGE COLLAPSING
ENCLOSED SHADY COURTYARD	QUIET RELAXING SPACE
▨ VISITOR PARKING LOT	UNSCREENED, MOSTLY USED BY OTHERS. WILL NOT MEET FUTURE PARKING DEMAND
STEEL BULKHEAD	MODERN VISUAL INTRUSION
SHALLOW WATER	USE LIMITED TO SHALLOW-DRAFT VESSELS
DEEP WATER	USED BY A VARIETY OF BOATS
DOCKS/MOORING	USED BY A MIXTURE OF BOAT TYPES/ MOSTLY MODERN
MAJOR STREET	DANGEROUS/SEPARATES PARK AREAS/ MODERN VISUAL INTRUSION
➚ PARKING LOT ENTRY	HIDDEN
MAJOR PEDESTRIAN CROSSING	DANGEROUS
OPEN VIEWS	GOOD VIEWS OF WHARVES AND HARBOR

*Floodplain and shellfish flat – see Natural Resource map



SITE ANALYSIS

SALEM MARITIME NATIONAL HISTORIC SITE

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
373 • 40,024B • DSC • MAR 91

BLANK PAGE

16

THE VISION FOR SALEM MARITIME NATIONAL HISTORIC SITE

The vision for Salem Maritime is to capture the spirit of the maritime era. In trying to capture this spirit, the site's most critical resource will be its prominent visual and physical link with the sea. For too long the park has been focused landward on architecture and furnishings. Now we must look to the wharves and the harbor, which were the major focus of maritime activity and can best tell the maritime story. The historic structures north of Derby Street, which are the park's most intact historic resources, should be strongly linked to the wharves so that the park functions as one unified site. Modern uses should be relegated to the edges of the site where they do not intrude on the historic maritime scene.

Of all the wharves, Derby Wharf offers land-tied visitors their best entry into the world of the sea. As people move along its length, the streetscape fades into the distance, and the sights, smells, and sounds of the sea become predominant. This narrow, fragile link with the sea is of the utmost interpretive value. One of the primary uses of the wharf should be to give visitors the opportunity to lose themselves at this tip of the land, and leave the modern world behind. The expansiveness and mystery of the view toward the sea from the tip of Derby Wharf can hopefully stir visitors' imaginations just as they have stirred the imaginations of Salem residents for the past 300 years.

Park use and development should create an overall image of maritime history. Within this setting visitors should sense the vibrant energy and excitement that marked the height of the maritime era, when the harbor was filled with ships, the wharves were lined with warehouses, and the stores along Derby Street were filled with exotic and valuable foreign goods. They should sense the importance of the great number and variety of ships and boats using the harbor and what it must have been like to go to sea during the age of sail. They should understand that the taxes collected at the U.S. Custom House helped finance the new nation. And they should gain insights into the character and lives of the people who were involved in the maritime trade. Wherever possible visitors should be invited to become active participants in the historic maritime scene. In addition to capturing the spirit of the height of the maritime era, interpretation should also convey the site's full historical context to help visitors understand that Salem's golden age was the culmination of generations of growth and a particular set of circumstances and that its decline was an inevitable part of history.

Primary emphasis should be placed on preserving and interpreting historic and archeological resources that have survived from the past. In addition, new facilities should be built or installed to help visitors comprehend the site's national significance, appreciate the spirit, life, and events that occurred there, and strengthen the ties between the resources.

As the interpretive story is reoriented, the relevance of the site's natural resources will become an important part of the story. Visitors should be helped to understand that the natural resources that exist or existed within the confines of the park boundary are parts of complex, evolving systems that have profoundly influenced, and been profoundly influenced by, human activity.

Programs should include festivals and special events focused on maritime history. These events, which should include day and nighttime activities, will encourage repeat visitation and help enliven the park.

INTERPRETIVE THEMES

The visitor experience described in the vision statement suggests four primary interpretive themes for the site: maritime trade, vessels and life at sea, the character of the people, and the evolution of the site.

Maritime Trade

The natural environment of New England drove early Salem inhabitants to the sea. The landscape was hilly, with thin, stony soils, but it offered protected natural harbors, seemingly endless forests, and the harvest from the sea. In the early years local fishing provided Salem residents with a secure economic base, allowing them to develop trade along the coast, with the West Indies and Nova Scotia, and across the Atlantic. The West Indies trade became very lucrative and was Salem's mainstay until the Revolution.

During the Revolution patriot seafarers carried the battle to sea. Privateering was crucial to the American effort in the early years of the war, and Salem seamen proved adept at this task. Over the course of the Revolution, the port's 158 privateering vessels took 458 British vessels, accounting for more tonnage than any other American seaport. Privateering profits founded the fortunes of many of Salem's prominent postwar merchants, including Elias Hasket Derby (who was perhaps the nation's first millionaire), helping them expand their enterprises and make Salem a center of world trade.

Between the Revolutionary War and the War of 1812 Salem became a major Far East trade center, making a significant contribution to the economic and political stature of the United States. The maritime trade was an extremely complex operation whose success depended on understanding natural and cultural phenomena occurring throughout the world. Global climate patterns, the international distribution of resources, and the demand for particular goods by people throughout the world were the studies of Salem merchants, who knew that their economic success depended on their knowledge of these factors.

Dried fish, whale oil, pork, lard, cheese, butter, flour, and live animals, including pigs, poultry, horses, and cattle, were typical New England exports. Salem merchants also re-exported items such as salmon from Canada; tobacco from Virginia; and wine and textiles from England. Typical imports included sugar, molasses, rum, cotton, and coffee from the Caribbean; coffee, cocoa, pepper, and cotton from the East Indies; cotton and cotton textiles from India; and tea from China. Although the exotic trade with the East Indies, India, China, and Africa was the most memorable, the bulk of Salem merchants' activities involved the North American coastal trade and trade with the West Indies and Europe. The port of Salem was an important transshipment point for the collection and redistribution of goods.

At its height, Salem's maritime trade required the coordinated efforts of almost everyone living in the community, and almost everyone's livelihood depended on it. Fishermen and farmers produced fish and agricultural goods for export. Shipwrights built the vessels used for fishing and transport of goods; sail makers, rope makers, riggers, smiths, and others outfitted and repaired these vessels; and Salem crews sailed them around the world. Merchants and their sea captains financed the expeditions and negotiated the trades. Dock workers loaded and unloaded cargo between the wharves and the ships; coopers, smiths, and others made and repaired the containers the cargo was shipped in; and teamsters transported the cargo on land. Inspectors examined the cargo; customs officials taxed it for the federal treasury; and shopkeepers bought and sold it. The sum of all of these activities and others made up the maritime trade and should be interpreted to help visitors understand how complex and all-encompassing it was.

Vessels and Life at Sea

Before steamships, trains, automobiles, and airplanes, sailing ships were the most advanced means of transportation of their time, the space shuttles of the maritime era. At its peak in 1807, Salem's fleet numbered some 200 vessels. Each ship had her own unique life, character, and history, and the most famous were known throughout New England and the world. Salem's fleet evolved in response to the variety of the city's maritime pursuits and included small fishing shallops; sloops and ketches, which were also used for fishing and for trade; schooners, which carried the bulk of the coastal trade; and larger brigs and East Indiamen, which could make the transoceanic voyages to Europe and the Indies. Salem's distinctive East Indiamen, with their rounded "kettle" bottoms, were specially designed to move in and out of Salem's shallow harbor and to minimize the risks of each voyage.

Salem was a shipbuilding center, and a few ships were built inside what is now the boundary of the national historic site. Enos Briggs constructed the *Grand Turk II* at the head of Derby Wharf in 1791. From roughly 1790 until 1830 Benjamin Hawkes and his partners maintained a boat repair facility that developed into a shipyard east of Derby Wharf. The construction of a ship often took several years and involved a great many different trades.

Vessels became sailors' homes for months and often years at a time. The crew were a mixed group of people who were willing to endure a gauntlet of dangers, rigorous work, and discomfort – some for the adventure, and some to escape worse conditions at home. Called "the people" by Salem merchants, this small community of sailors carried the fate of a venture in their hands as they ranged over the world's immense oceans. Once aboard ship, sailors lost all rights – no one could challenge the authority of the captain. Living conditions were cramped and uncomfortable, work schedules were rigid, and disease was common. Crews battled gale-force winds pushing 30-foot waves, endured windless doldrums, and lived with the fear of being carried to a sudden end against some rocky coast. Still, shipboard life could range from terrifying to relatively pleasant, depending on the wind and the friendliness or hostility of all the foreigners encountered along the route.

Character of the People

Ultimately, history is the story of people. The people of Salem were a product of the Puritan attributes of thrift, conservation, and hard work, tempered by the Yankee characteristics of boldness, inventiveness, mechanical ingenuity, and a willingness to test the unknown. They were repeatedly successful at seizing opportunity. When Salem's Puritan founders left England to cross the ocean and settle on the edge of the New World, they were buoyed by a powerful bond of common beliefs and a determination to live according to their "inner light." Focused thus within, they were able to creatively adapt to whatever circumstances presented themselves without. When Salem's coast proved less than bountiful, they quickly turned to the sea, becoming fishermen, shipbuilders, and world merchants. In an extraordinarily short time, from a remote corner of the world, they flourished and competed successfully with great nations for the prize of the age – trade with the Far East.

"Fortune favors the bold." This ancient maxim is a fitting epitaph for Salem's most successful merchants. Those like Elias Hasket Derby took chances, dispatching vessels to unproven markets, buying exotic goods, and trying uncharted routes. Derby made bold and imaginative moves and invented new ways to broaden the scope of his trade and increase his market. The merchant business supported many businesses and in turn was supported by these businesses. Craftspeople, such as the rope maker who lived in the Narbonne house, made items used on the ships, and later Benjamin Hawkes built and repaired the ships of merchant traders. Much of the success of Salem's maritime era came from hard-working enterprising people of the area working together in support of maritime trade.

When their maritime trade declined, Salem's residents again assessed their resources and looked to the water – this time to the rivers, whose power they harnessed to drive new industries devoted to leather and textiles. Their hard work, thrift, and ingenuity once again ensured their prosperity in new methods and markets.

Evolution of the Site

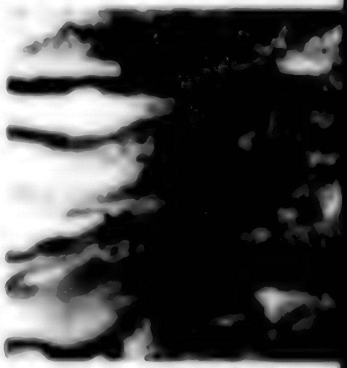
History represents a continuous progression of events, and sites evolve to accommodate changing needs and values. The Salem Maritime site has evolved through three major periods: early settlement, the height of the maritime era, and industrial development.

The early settlement years, with emphasis on fishing, shipbuilding, and trading, laid the foundation for Salem's world trade. They were a time of experimentation and growth, as the early settlers turned to the sea for their livelihood and discovered rich fishing grounds and opportunities for trade with the West Indies and Europe. When the Revolution erupted, Salem's seamen turned privateers, amassing fortunes that helped them launch more ambitious trading ventures after the war, ushering in the height of the maritime era.

As the 19th century progressed, trade embargoes stimulated industrial development, since they required goods to be produced and capital to be invested locally. Wealthy Salem merchants invested heavily in early industries. As Salem's major maritime activity gave way to interior development and better positioned ports, the wharves gradually changed from a maritime transportation center supporting overseas trade to a waterfront bulk storage facility. Commodities such as paving stones, gravel, grain, coal, and wood were off-loaded in bulk and sold wholesale. The wharf also supported industries such as fish processing and sail making. Areas that had once housed the maritime elite became the neighborhoods of immigrant factory workers, as much of the site was infilled with tenement housing. Much of the industrial-era development has now disappeared from the site. Some industrial vessels still use the harbor, but it is being increasingly used for recreation as the city's needs are gradually shifting once again.

The evolution of the site has been profoundly influenced by the natural shoreline environment. For example, the infertility of New England's rocky shore was the impetus that first turned the early settlers to the sea, and the silting in of the harbor, coupled with the deeper drafts of the later sailing ships, was one of the reasons Salem's maritime trade eventually declined. But the natural environment, as well as being an influencing factor, has also been influenced by site evolution, and it is drastically different today than it was in historic times.

PART TWO: ALTERNATIVES



ALTERNATIVE 1: NO ACTION

Salem Maritime National Historic Site would be developed the same as today. Action would be limited to rehabilitating the historic wharves to ensure their long-term preservation. The wharves would remain a grassy open space, and interpretation would remain focused on the buildings north of Derby Street. An exhibit plan is currently underway to guide the upgrading and expansion of exhibits inside many of the buildings. Visitors would be able to experience the refurbished interiors of these resources or would receive information on the structures' historical significance through waysides. The grounds around the buildings would be a quiet enclosed backyard environment that would be a welcome retreat from the exposed open space of the wharves.

Access and Circulation

- Visitors would continue to drive to the site and park in the Central Wharf parking lot or find parking elsewhere in the neighborhood.

- Derby Street would remain open to parking by residents and visitors.

Orientation and Support Facilities

- The existing contact station would be retained.

- The restrooms would remain on the north side of Derby Street, behind the Hawkes house.

- The picnic area would remain in the middle of the parking lot.

Interpretive Media and Programs

- The historic buildings north of Derby Street would receive new exhibits as outlined in the 1990 *Interpretive Prospectus*.

    The Custom House, in its historic grandeur, would illustrate the functions and purposes of the U.S. Customs Service in relation to the site. A secondary theme would be Nathaniel Hawthorne's employment in the U.S. Customs Service and his connection to the literary history of America. The bonded warehouse behind the Custom House would feature the varied cargoes that once arrived on Salem's wharves and were held in bond. Exhibits would be added to the second floor, which would continue to be used for school and other programs during the summer. The scale house would be used to interpret weighing activities.

    The Hawkes house would be interpreted through a wayside exhibit. The grounds behind the Hawkes, Derby, and Narbonne houses would be maintained in their present condition as a pleasant place to stop and rest or to enjoy small-scale special events, such as storytelling, concerts, and other performances.

    The refurnished Derby house would be interpreted by guided tours, and other aspects of the Derby family would be interpreted through exhibits. The grounds would be maintained in their current condition, and a wayside would illustrate the appearance of the grounds during Derby's time.

The Narbonne house would be interpreted on guided tours, and exhibits would illustrate the evolution of the structure, its use by various occupants, and the archeological findings from the site. The existing wayside would describe the yard in relationship to the house.

- The existing waysides would remain the primary means of wharf interpretation.

Recreation

- The majority of the site would remain available as recreational open space.
- Limited docking facilities, inaccessible to persons with disabilities, would remain available to visitors on Central Wharf.
- The two deteriorated piers on Derby Wharf would be removed.

Wharf Rehabilitation and Dredging

- No dredging would occur.
- The east side of Central Wharf, which is badly deteriorated, would be replaced with new bulkhead designed to retain the wharf's historic appearance. The steel bulkhead on the west side of the wharf would be faced with wood.
- Seepage of seawater into Derby and Hatch's wharves would be remedied by filling the voids in the walls with packets of premixed portland cement mortar and replacing the missing granite blocks. About 200 feet of defective timber bulkhead on Derby Wharf would be replaced in kind with an appropriate tie-back system.

Maintenance Facilities

- Maintenance facilities would remain scattered among historic structures on the site.

ALTERNATIVE 2: THREE-DIMENSIONAL INTERPRETIVE FORM

Alternative 2 would seek to visually and interpretively tie the site together and to establish a strong sense of its historic waterfront character by balancing the visual impression of the historic structures in the north with a reconstructed period vessel, visiting wooden sailing vessels, and new three-dimensional forms on the wharves. The reconstructed vessel would be a tangible expression of the most critical element of the maritime trade and greatly enhance the story of sailing vessels and how they linked Salem Harbor with marketplaces around the world. Also, it could be built on site, affording a year-long, evolving opportunity for the study and interpretation of historic shipbuilding techniques. No original or reconstructed vessels that would meet the needs of the site are available; however, sufficient data exist to reconstruct a number of Salem ships. Sufficient data do not exist to reconstruct the historic warehouse buildings on the wharves, so the three-dimensional expressions would be contemporary interpretive structures in compliance with NPS policies and guidelines. They would include contemporary interpretive buildings, *ghosted* outlines of buildings,[1] and marked foundation lines, which together would illustrate the scale, alignment, and density of wharf development during the maritime period. They would be placed as accurately as possible in the locations of the warehouses that existed on the wharf in 1830. The site would be further unified by giving Derby Street a more historic appearance and by emphasizing the relationships between the wharves and the rest of the site in the interpretive programs. The visitor experience would be improved as follows.

---

[1] *Ghosting refers to the framing of portions of a building to provide a sense of the structure's historic proportions. Ghosting can be accomplished minimally through outlining a building's shape or can be done more fully through partially completing certain surfaces, such as a wall or roof, to create a more complete image.*

As proposed in the Salem Project study, visitors would first go to a downtown visitor center, where they would receive information about Salem Maritime and a variety of related sites. Consistent with the transportation plan, they would park at the East India Square garage and either walk or take a shuttle bus to the historic site. To ensure easy access to Salem Maritime for all visitors, the National Park Service would propose to provide shuttle bus service, and it would also encourage a boat shuttle service to connect tourist-oriented sites along the shoreline. The use of the East India Square garage for visitor parking and the shuttle bus connection would be tested before any permanent on-site parking changes were made at Salem Maritime.

The park entrance on Derby Street would be redesigned to give visitors a strong sense of arrival and to integrate visitor transportation, contact, and comfort facilities into a pleasing and well-functioning complex. From this orientation area visitors would be drawn to Derby Wharf, where tangible expressions of historic structures, a reconstructed period vessel, and exhibits would be grouped together into a major wharf life exhibit. Interpretive programs in this area would invite visitors' participation in a lively harbor experience. Visitors would have the chance to go on board a reconstructed period vessel, to examine its architecture, participate in demonstrations of seafaring skills, and experience what shipboard life must have been like. Exhibits and demonstrations within the warehouse structures could illustrate privateering, global trade, warehouse layout and functions, and the evolution of Derby Wharf. Visitors would be encouraged to use all their senses – to see and feel the scale and tightness of historic vessels and historic wharf development, to hear the commotion of workers unloading cargo and repairing a ship, to touch the historic materials, and to smell the odors of cargo spices and the mustiness of a vessel's quarters. Development would become progressively less apparent down the length of the wharf, allowing visitors to gradually lose the sense of activity and development and to become increasingly aware of the surrounding sea.

Moving back to the head of the wharf, visitors' attention would be directed to the strong links between the wharves and the structures to the north: how the taxes on maritime goods, calculated and paid at the Custom House, provided revenues for the new nation; the life-styles of various people, ranging from millionaire merchants to craftsmen, who had direct effects on the wharves and wharf activities; and how the West India Goods Store exemplifies one of the final links in the transport of goods from foreign ports, to the wharves, through customs, and finally into the stores for retail consumption.

To provide a changing and lively harbor experience in keeping with the historic atmosphere of the site, visiting wooden sailing vessels would be encouraged to dock on the east side of Central Wharf and provide programs and/or tours for the general public. Whenever visiting wooden sailing vessels were in port, they would also be major site attractions. Daytime docking facilities to make the site accessible by water would be provided on this wharf's western edge.

Maintenance would be relocated off the site to a new property to be acquired for that purpose. No on-site locations are appropriate for maintenance because of impacts on cultural resources and the historic scene. Three off-site locations might be suitable for this facility: a property on Blaney Street about a quarter mile east of the historic site, the site of the former East Branch Library on Essex Street, and property owned by the city at Fort Avenue and Prusak Square. These properties are described in greater detail in the "Description of the Environment." This action would be contingent on more detailed studies, new legislation, and additional appropriations. The new site would also be used to replace the parking removed from Derby Street. Once legislation and acquisition occurred, a site plan and environmental assessment would be developed prior to design and construction. Pending the development of a permanent maintenance facility it might be necessary to establish an interim maintenance facility at a leased site.

Access and Circulation

- The Central Wharf parking lot would be replaced by a public use area for picnicking and interpretation, and visitors would park instead at the East India Square garage. The National Park Service would provide shuttle bus service from the Salem Project visitor center to the site. A shuttle bus drop-off and parking spaces for visitors with disabilities would be provided near the contact station.
- Most tour buses would deliver visitors to the downtown Salem Project visitor center, where they would receive the same orientation and have the same options for transportation to the national historic site as other visitors. Two drop-off spaces for tour buses would be available in front of Pickering Wharf, less than a block from the national historic site.
- Working cooperatively with the city of Salem, the National Park Service would seek to make Derby Street one-way eastbound through the national historic site. Orange Street would be changed to one-way going north to Essex Street. Barrier-free street crossings would be clearly marked at appropriate locations. The south side of Derby Street would be closed to parking during the hours that the visitor facilities were open (8 a.m. to 5 p.m.), with the exception of two parking spaces for visitors with disabilities. An equal amount of replacement parking (22 spaces) would be provided at a new maintenance/parking facility within one-half mile of the site.
- A tour-boat drop-off would be located on the west side of Central Wharf, where it would not intrude on the historic scene. No tour boat would be stored at the site.

Orientation and Support Facilities

- The existing contact station on Central Wharf would be retained. New media would interpret the evolution of the site and introduce the other interpretive themes.
- The outline of the Forrester warehouse would be ghosted, and the framework would be used to partially enclose a waiting area where visitors could wait for the shuttle bus. Waysides would be provided to orient visitors when the contact station was closed.
- The open space at the head of Hatch's Wharf would serve as a small

gathering place for demonstrations and for viewing the site's inner harbor. Portable interpretive aids would be used in this area.

- The restrooms would be removed from the north area of the park and replaced with new restrooms on Central Wharf. The facility would either be an addition to the contact station or a new structure nearby.

Interpretive Media and Programs

- A concentration of new interpretive facilities would be placed near the northern end of Derby Wharf. Interpretation would continue but would become progressively less structured as visitors moved toward the end of the wharf:

  The *Friendship*, a merchant ship from the period 1760-1830, would be reconstructed and docked on the west side of the wharf. Programs above and below deck would interpret vessel architecture, navigation, ship functions, and life at sea. The vessel's interpretive areas would be accessible to all visitors, including people with disabilities.

  One or two winterized buildings would be constructed immediately across the wharf from the reconstructed ship. These buildings would house year-round exhibits and demonstrations interpreting such stories as the evolution of Derby Wharf, warehouse functions, and maritime trade. Farther down the wharf, several ghosted three-story building outlines would indicate the forms of additional warehouses and provide partially enclosed spaces for ship maintenance activities and for special events. Beyond these structures, a series of low outlines of warehouse foundations would express the continuation of the warehouses along the wharves.

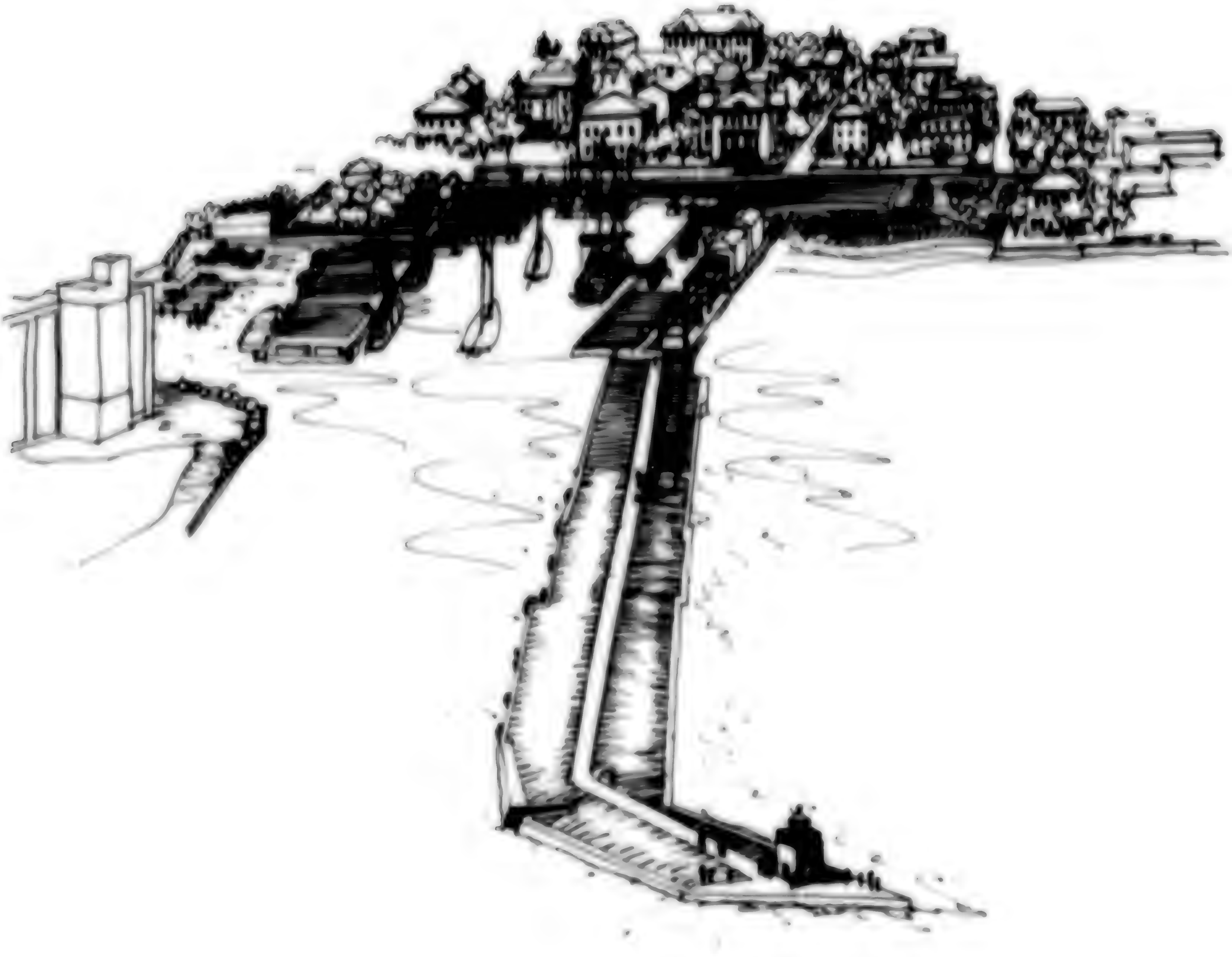
  Wharf sculpture and interpretive aids would be placed along the wharf.

  The end of Derby Wharf would be retained as open space with waysides and a lighthouse to further explain the history of the wharves and the surrounding area.

- An outdoor shipbuilding and repair exhibit would occupy a portion of the open area east of Derby Wharf. The reconstructed vessel could be built in this area, followed by a partially constructed vessel exhibit that would be permanently displayed here. Dory building and small vessel repair would be ongoing activities and a small structure would be provided to support that program.

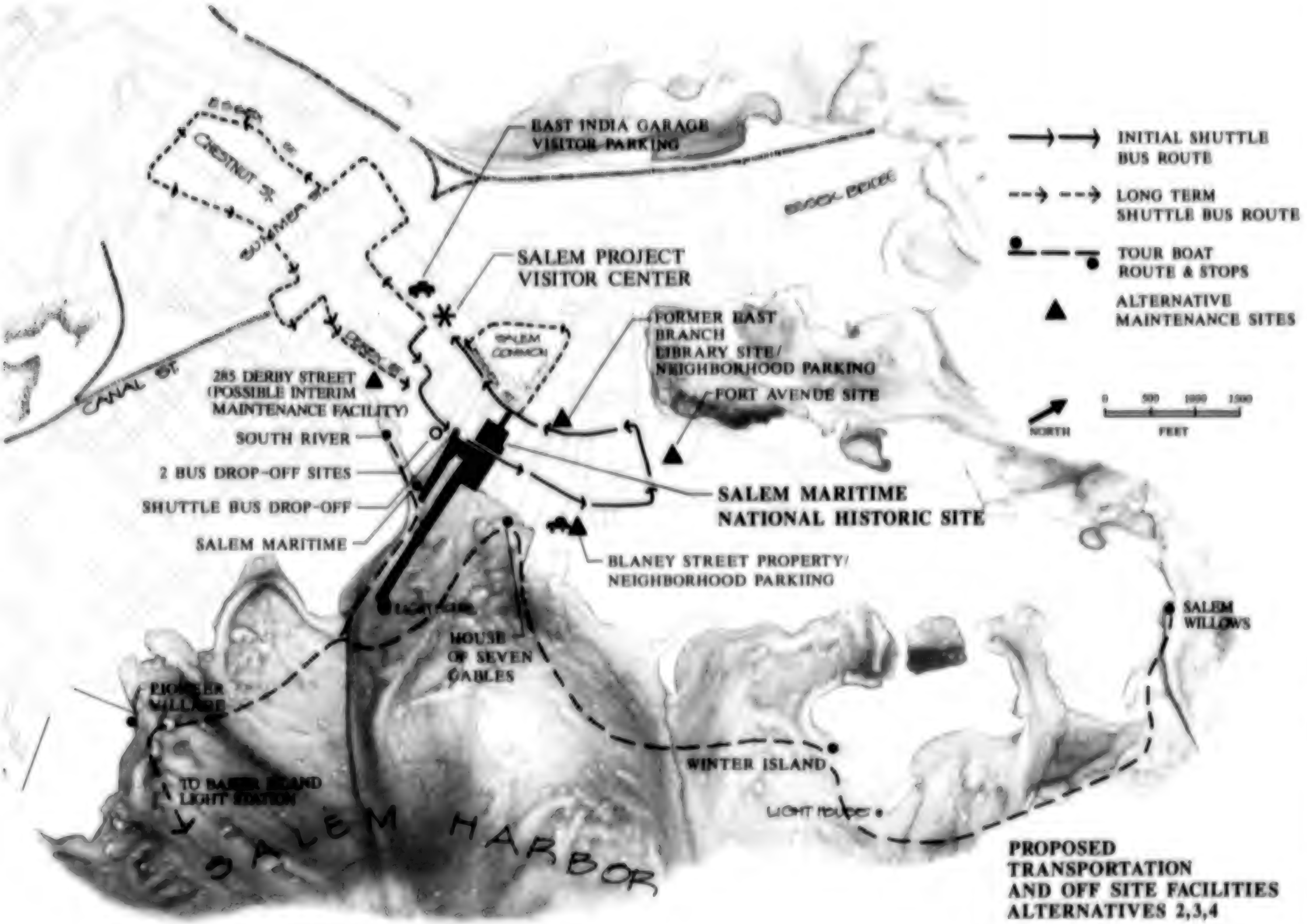
- Visiting wooden sailing vessels offering public programs would be encouraged to dock for periods of time along the east side of Central Wharf. Showers for crews would be provided in conjunction with the public restrooms on Central Wharf.

- Derby Street would be resurfaced to appear more historic and the power lines would be replaced underground. The street would be interpreted as an important transportation route that helped distribute the harbor's resources.



PERSPECTIVE
**ALTERNATIVE 2:
THREE DIMENSIONAL
INTERPRETIVE FORM**

BLANK PAGE



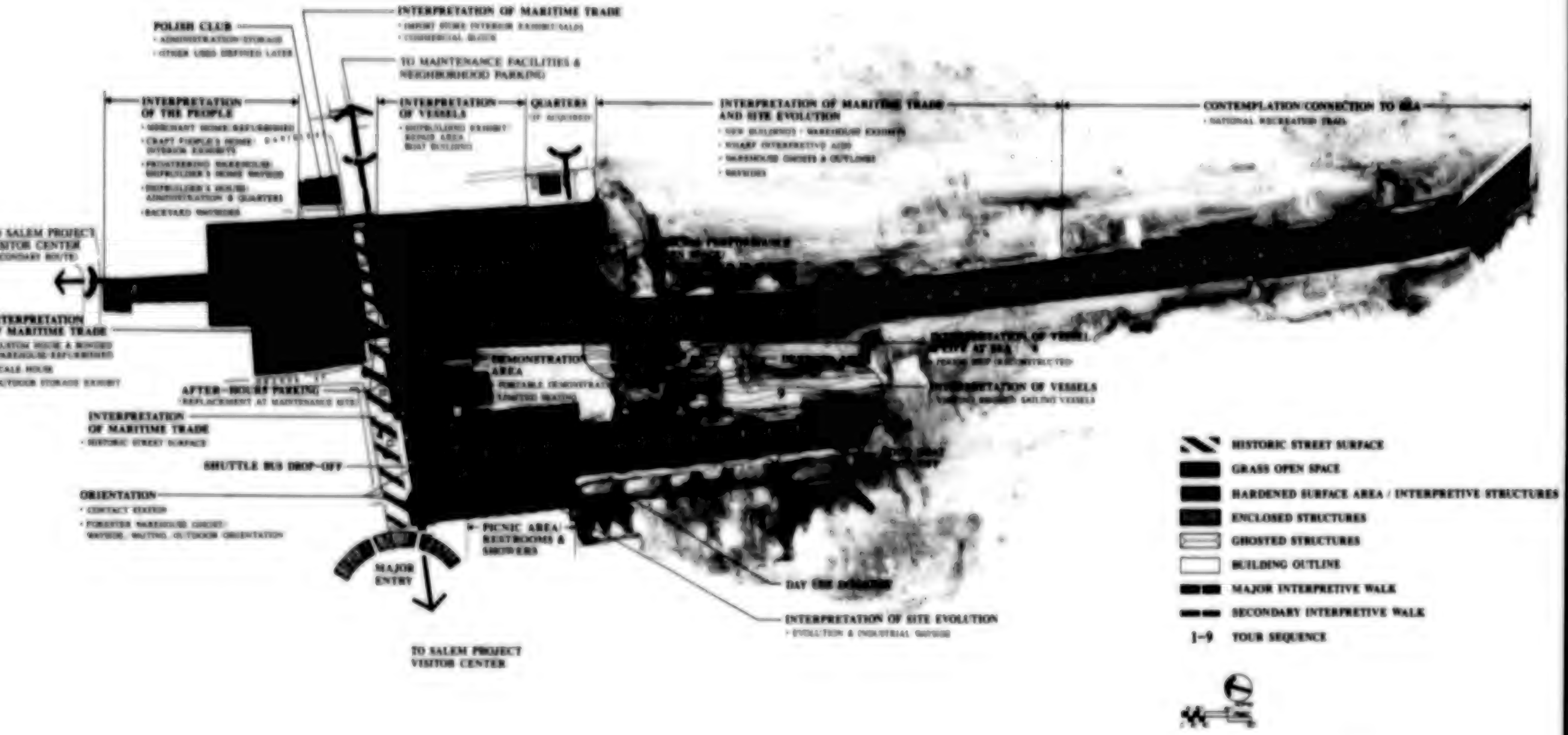
EAST INDIA GARAGE VISITOR PARKING
SALEM PROJECT VISITOR CENTER
FORMER EAST BRANCH LIBRARY SITE/ NEIGHBORHOOD PARKING
FORT AVENUE SITE
285 DERBY STREET (POSSIBLE INTERIM MAINTENANCE FACILITY)
SOUTH RIVER
2 BUS DROP-OFF SITES
SHUTTLE BUS DROP-OFF
SALEM MARITIME
SALEM MARITIME NATIONAL HISTORIC SITE
BLANEY STREET PROPERTY/ NEIGHBORHOOD PARKIING
HOUSE OF SEVEN GABLES
PIONEER VILLAGE
TO BAKER ISLAND LIGHT STATION
WINTER ISLAND
LIGHT HOUSE
SALEM WILLOWS
SALEM HARBOR
CHESTNUT ST
SUMMER ST
CANAL ST
SALEM COMMON
BRIDGE ST
LAFAYETTE ST
DERBY ST
BEVERLY BRIDGE
INITIAL SHUTTLE BUS ROUTE
LONG TERM SHUTTLE BUS ROUTE
TOUR BOAT ROUTE & STOPS
ALTERNATIVE MAINTENANCE SITES
NORTH
0 500 1000 1500
FEET

PROPOSED TRANSPORTATION AND OFF SITE FACILITIES ALTERNATIVES 2,3,4

SALEM MARITIME
NATIONAL HISTORIC SITE

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
373 • 40,025B • DSC • FEB 91 SHEET 2 OF 2

BLANK PAGE


POLISH CLUB
• ADMINISTRATION/STORAGE
• OTHER USES DEFINED LATER
INTERPRETATION OF MARITIME TRADE
• IMPORT STORE INTERIOR EXHIBIT/SALES
• COMMERCIAL BLOCK
TO MAINTENANCE FACILITIES & NEIGHBORHOOD PARKING
INTERPRETATION OF THE PEOPLE
• MERCHANT HOME REFURBISHED
• CRAFT PEOPLE'S HOME: INTERIOR EXHIBITS
• PRIVATEERING WAREHOUSE SHIPBUILDER'S HOME WAYSIDE
• SHIPBUILDER'S HOUSE: ADMINISTRATION & QUARTERS
• BACKYARD WAYSIDES
INTERPRETATION OF VESSELS
• SHIPBUILDING EXHIBIT REPAIR AREA BOAT BUILDING
QUARTERS
(IF REQUIRED)
INTERPRETATION OF MARITIME TRADE AND SITE EVOLUTION
• NEW BUILDINGS: WAREHOUSE EXHIBITS
• WHARF INTERPRETIVE AIDS
• WAREHOUSE GHOSTS & OUTLINES
• WAYSIDES
CONTEMPLATION/CONNECTION TO SEA
• NATIONAL RECREATION TRAIL
TO SALEM PROJECT VISITOR CENTER (SECONDARY ROUTE)
INTERPRETATION OF MARITIME TRADE
• CUSTOM HOUSE & BONDED WAREHOUSE REFURBISHED
• SCALE HOUSE
• OUTDOOR STORAGE EXHIBIT
DEMONSTRATION AREA
• PORTABLE DEMONSTRATION
• LIMITED SEATING
INTERPRETATION OF VESSEL LIFE AT SEA
• FRIENDSHIP (RECONSTRUCTED)
INTERPRETATION OF VESSELS
• VISITING SAILING VESSELS
AFTER-HOURS PARKING
• REPLACEMENT AT MAINTENANCE SITE
INTERPRETATION OF MARITIME TRADE
• HISTORIC STREET SURFACE
SHUTTLE BUS DROP-OFF
ORIENTATION
• CONTACT STATION
• FORRESTER WAREHOUSE GHOST: WAYSIDE, WAITING, OUTDOOR ORIENTATION
MAJOR ENTRY
PICNIC AREA RESTROOMS & SHOWERS
DAY USE DOCKING
INTERPRETATION OF SITE EVOLUTION
• EVOLUTION & INDUSTRIAL WAYSIDE
TO SALEM PROJECT VISITOR CENTER
9
HISTORIC STREET SURFACE
GRASS OPEN SPACE
HARDENED SURFACE AREA / INTERPRETIVE STRUCTURES
ENCLOSED STRUCTURES
GHOSTED STRUCTURES
BUILDING OUTLINE
MAJOR INTERPRETIVE WALK
SECONDARY INTERPRETIVE WALK
1–9 TOUR SEQUENCE

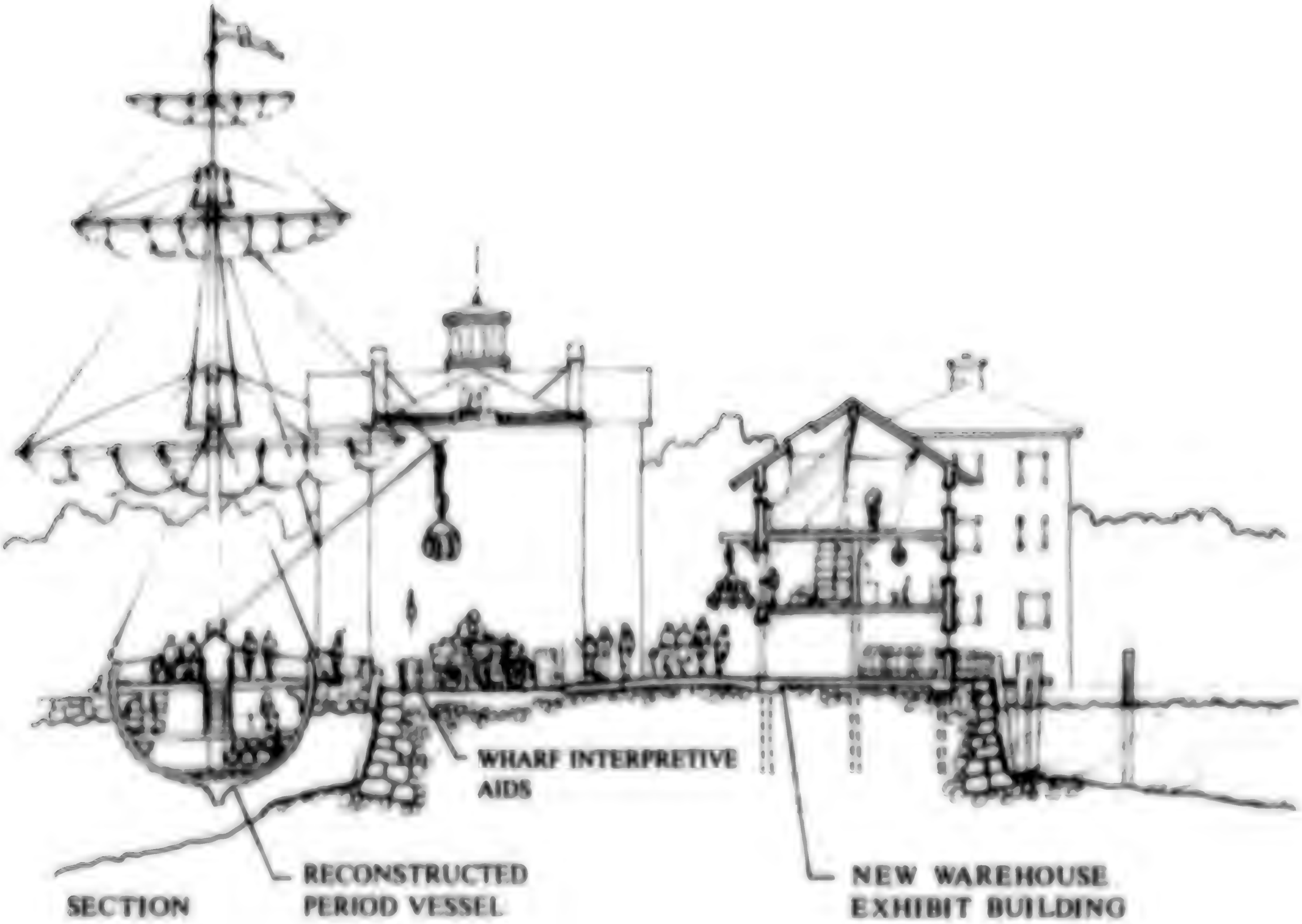
ALTERNATIVE 2: THREE-DIMENSIONAL INTERPRETIVE FORM

SALEM MARITIME NATIONAL HISTORIC SITE

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

373-40,000 · DSC · MAR 91

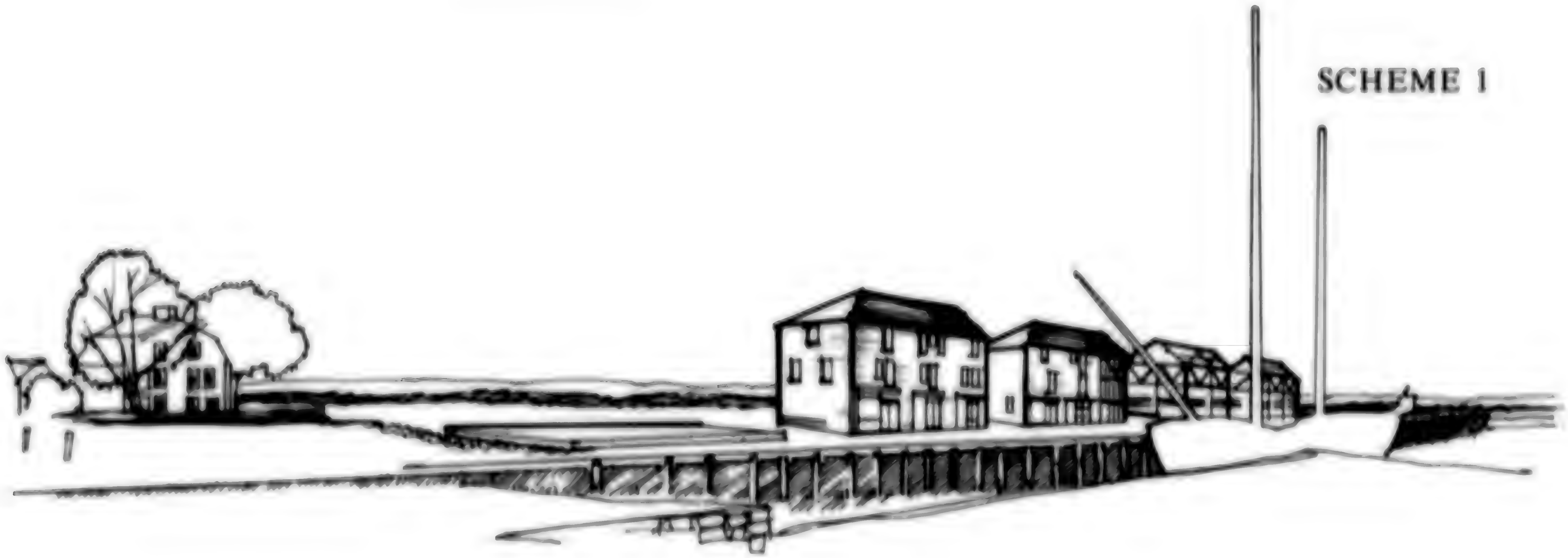
BLANK PAGE



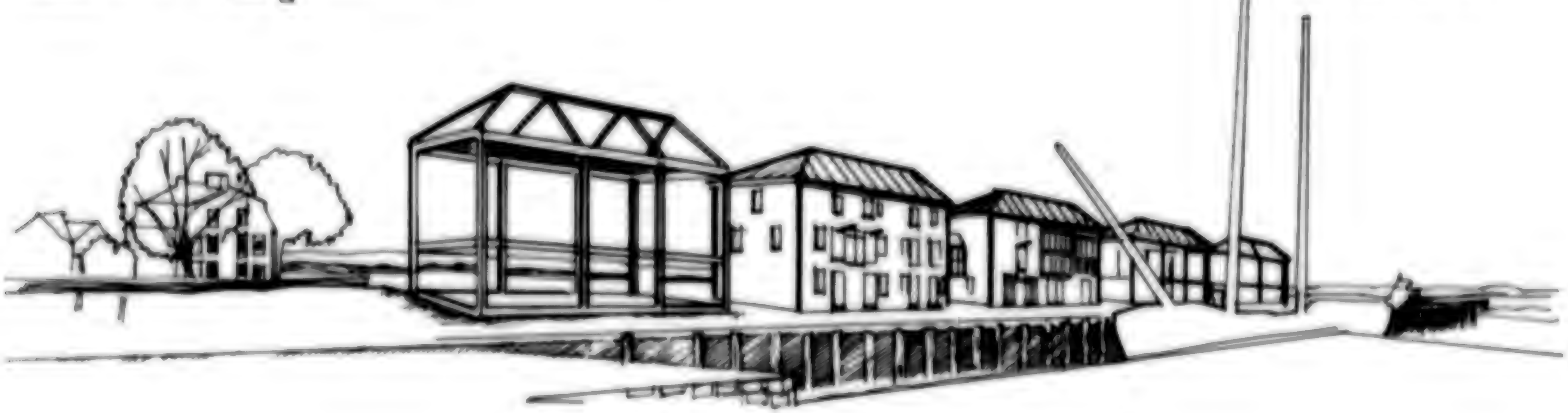
DERBY WHARF
INTERPRETIVE AREA

Friendship, Ship of Salem, painting by Guiseppi Fedi courtesy of the Peabody Museum.

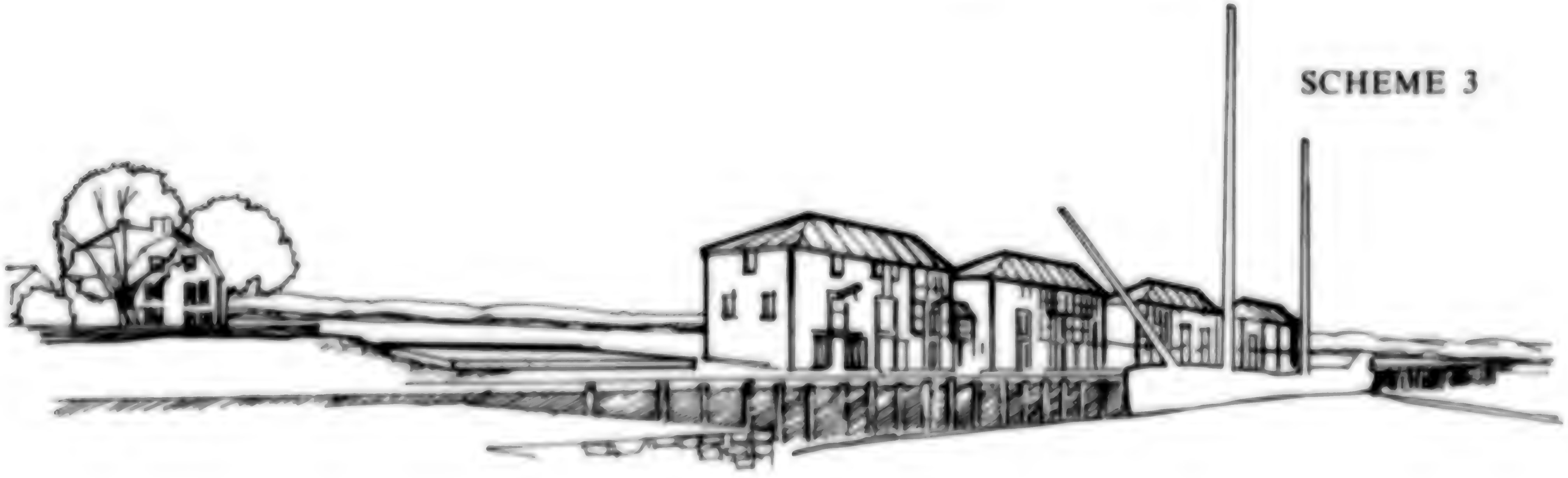
RECONSTRUCTED PERIOD VESSEL



SCHEME 1



SCHEME 2



SCHEME 3

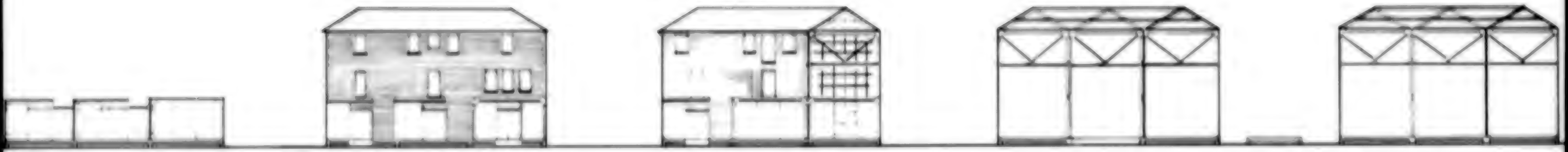
OPTIONAL WAREHOUSE PERSPECTIVES

SALEM MARITIME
NATIONAL HISTORIC SITE

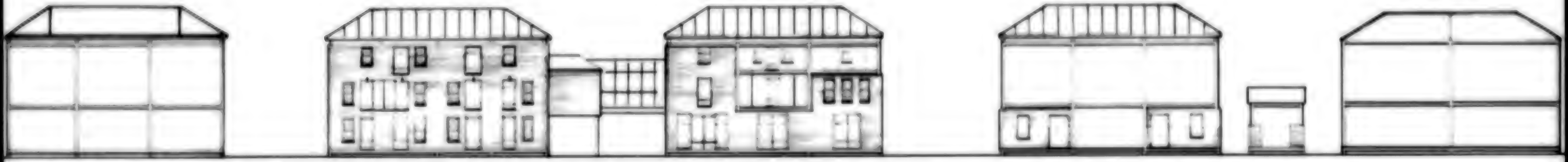
UNITED STATES DEPARTMENT OF THE INTERI
NATIONAL PARK SERVICE
373 • 40036B • DSC • MAR 91

BEST COPY AVAILABLE

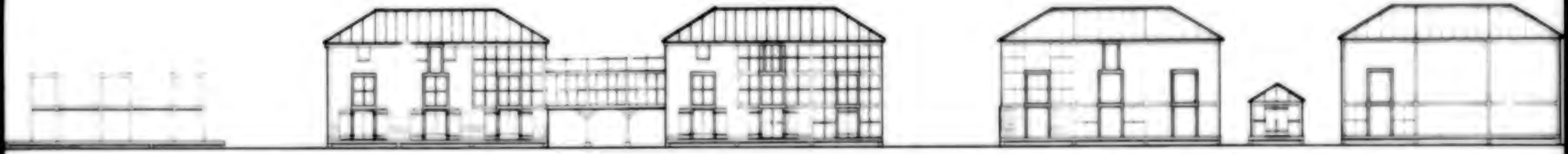
SCHEME 1



SCHEME 2

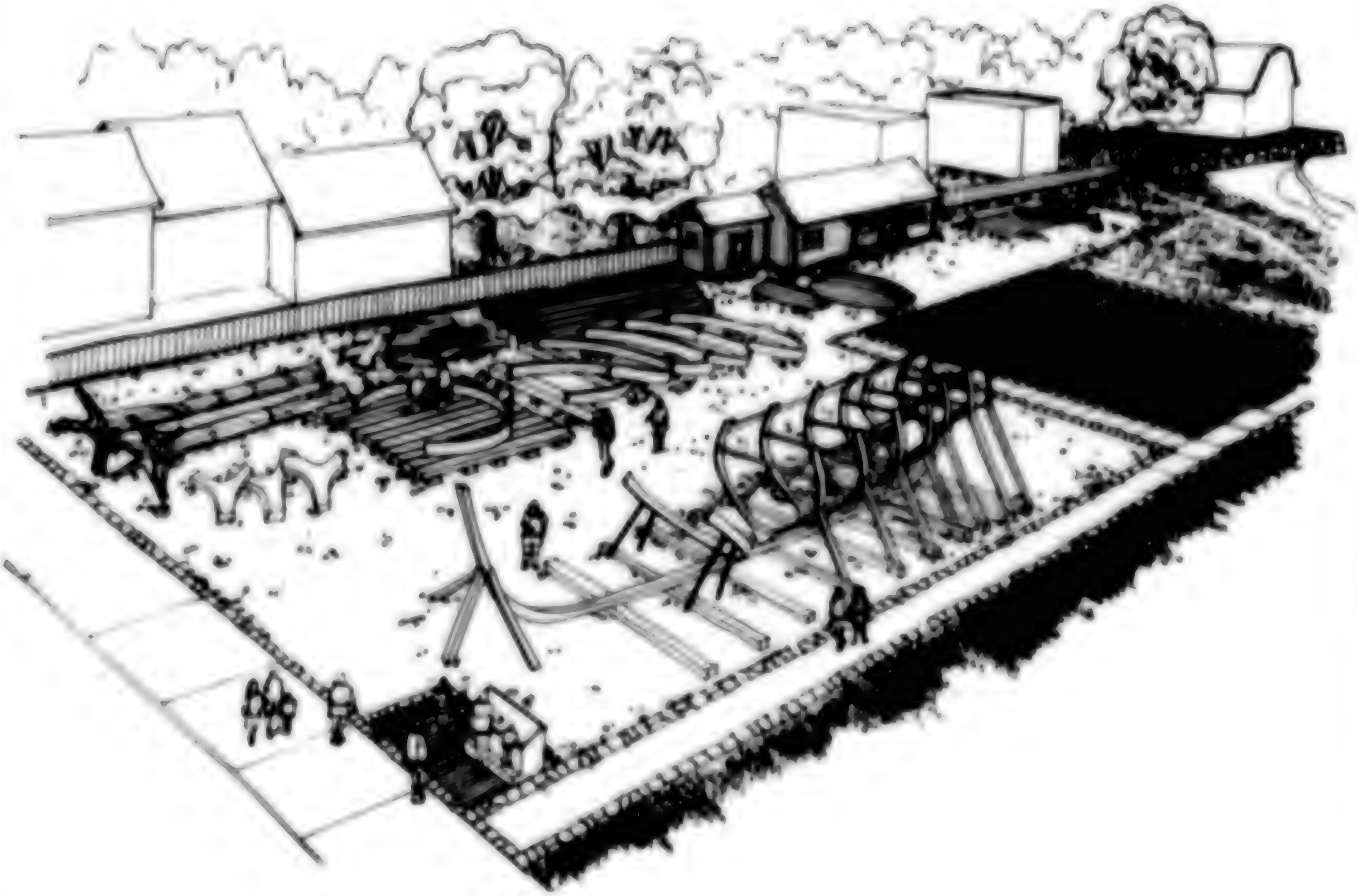


SCHEME 3



OPTIONAL SCHEMES FOR NEW WAREHOUSE AND GHOSTED BUILDINGS

SALEM MARITIME
NATIONAL HISTORIC SITE
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
373 • 40,035A • DSC • MAR 91



SHIPBUILDING/REPAIR EXHIBIT AREA

- The historic buildings north of Derby Street would receive new exhibits as in alternative 1. Interpretive aids would be installed in the yard behind the bonded warehouse. The yards between the residences would remain a neutral open space with waysides to link the historic yard uses to the homes and to provide a quiet space for small performances.

Recreation

- A shady picnic area would replace the Central Wharf parking lot.
- The west side of Central Wharf would be used for day-use boat docking.
- Mooring of boats between Derby and Central wharves would be discontinued.
- The two deteriorated piers on Derby Wharf would be removed.
- An open grassy space and Derby Beach would remain just east of Derby Wharf to be used for special performances and spontaneous play.

Wharf Rehabilitation and Dredging

- Dredging would occur along the east side of Central Wharf from the marine railway to the south end to accommodate a variety of visiting vessels with drafts up to 12-13 feet. The east side of Central Wharf, which is badly deteriorated, would be replaced with new bulkhead designed to accommodate wharfside mooring of visiting vessels requiring up to a 13-foot water depth at mean low water. The new bulkhead would be designed to retain the wharf's historic appearance, and the steel bulkhead on the west side of the wharf would be faced with wood.
- Dredging would also be required along a 200-foot-long section of Derby Wharf to allow the reconstructed vessel to dock. Steel piling would be installed below mean low water to protect the wharf. Seepage of seawater into Derby and Hatch's wharves would be remedied as described for alternative 1.

Maintenance Facilities

- A new 4,000-square-foot maintenance facility would be developed at a suitable site within one-half mile of the site. The structure would accommodate a staff of seven, and provide various shops and storage areas.

ALTERNATIVE 3: LOW-PROFILE INTERPRETIVE MEDIA

Alternative 3 would accept the site in its present form and focus visitors' attention on the surviving historic structures, including not only the buildings north of Derby Street but also the wharves themselves, which are some of the few surviving examples of their kind. Rather than attempt any physical expressions or impressions of former development, it would allow the empty wharves to speak for themselves about the rise and decline of the maritime era. The spirit of adventure that has historically been associated with wharfside activity would be captured through a variety of low-profile and portable media and personal service demonstrations. As part of the Salem Project (which would apply under all the alternatives) people would be directed to existing resources, such as the Peabody Museum, the Essex Institute, the Essex Shipbuilding Museum, and the various historic vessels docked from Gloucester to Boston, for further expression of the story. The visitor experience would be improved as follows.

Visitor access and orientation would be similar to that described for alternative 2. Visitors would receive Salem Project information at the downtown visitor center before traveling to Salem Maritime. Parking would be centralized downtown, and a shuttle bus would provide regularly scheduled service between the parking lot and the historic site. The site entrance on Derby Street would be improved to give visitors a sense of arrival. The visitor contact station would provide information and an overview of the site, and also prepare visitors for an outdoor wharf visit by interpreting maritime trade in somewhat more depth than the introduction given in alternative 2.

Outdoor demonstrations on the wharves would encourage visitors to participate in many activities associated with shipping, cargo handling, and revenue collection. Wherever possible, activities would cross Derby Street, linking these two areas of the site and interpreting how they were interrelated. For example, visitors might move from a cargo-weighing demonstration on the wharf directly to the Custom House, where they would present a bill of lading for "processing."

The history and former appearance of the wharves would be addressed through large wayside illustrations and an audio tour. Through this two-dimensional artwork and dialogues and background sounds, visitors would be primed to imagine what it must have been like to go off to sea in a tiny vessel, facing uncertain dangers and rewards, or to stand at the tip of the wharf and watch an East Indiaman round the tip of Marblehead on her return from China.

This approach would give potential to a wide variety of images of people's life experiences during the maritime period.

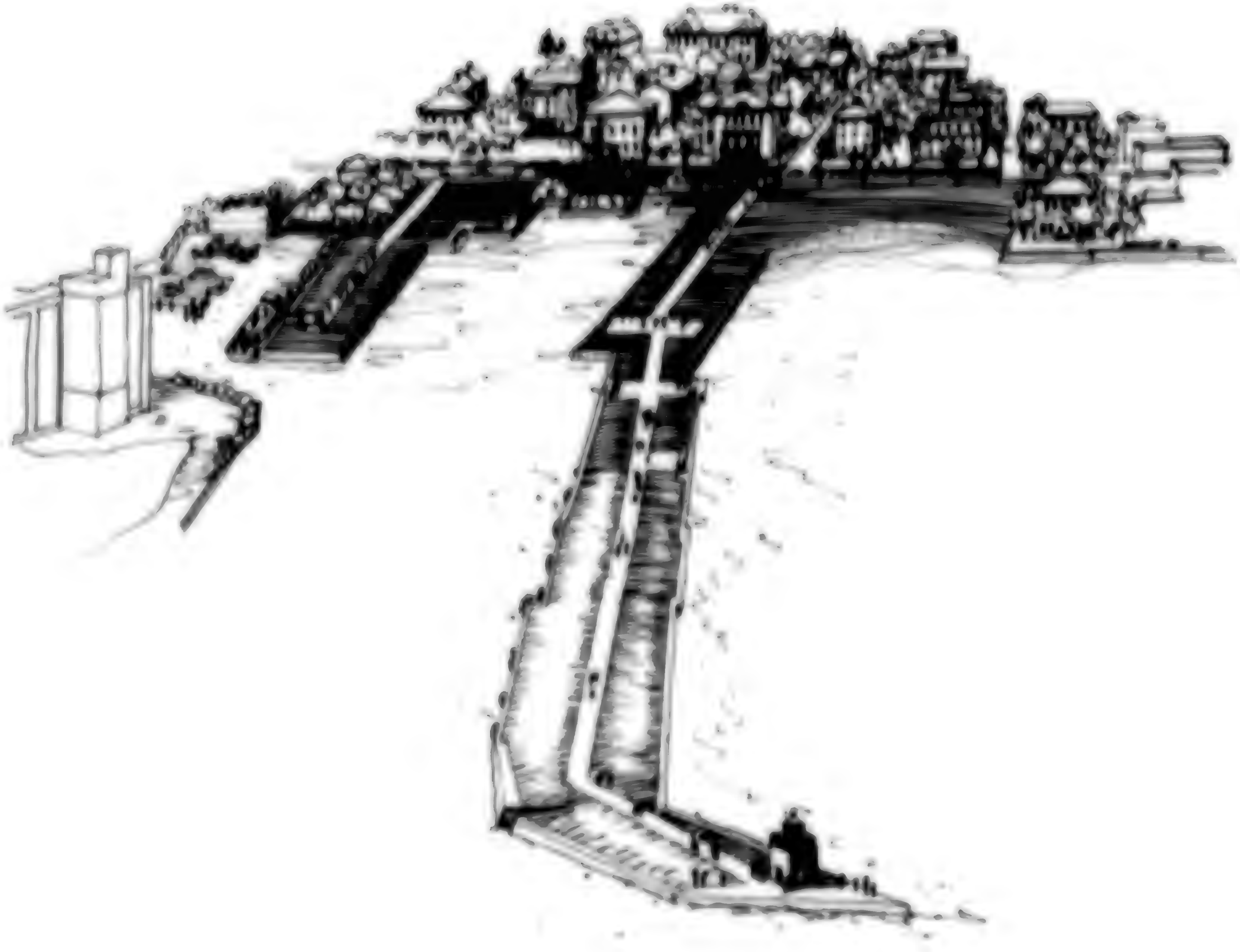
Maintenance functions would be relocated off the site the same as in alternative 2.

Access and Circulation

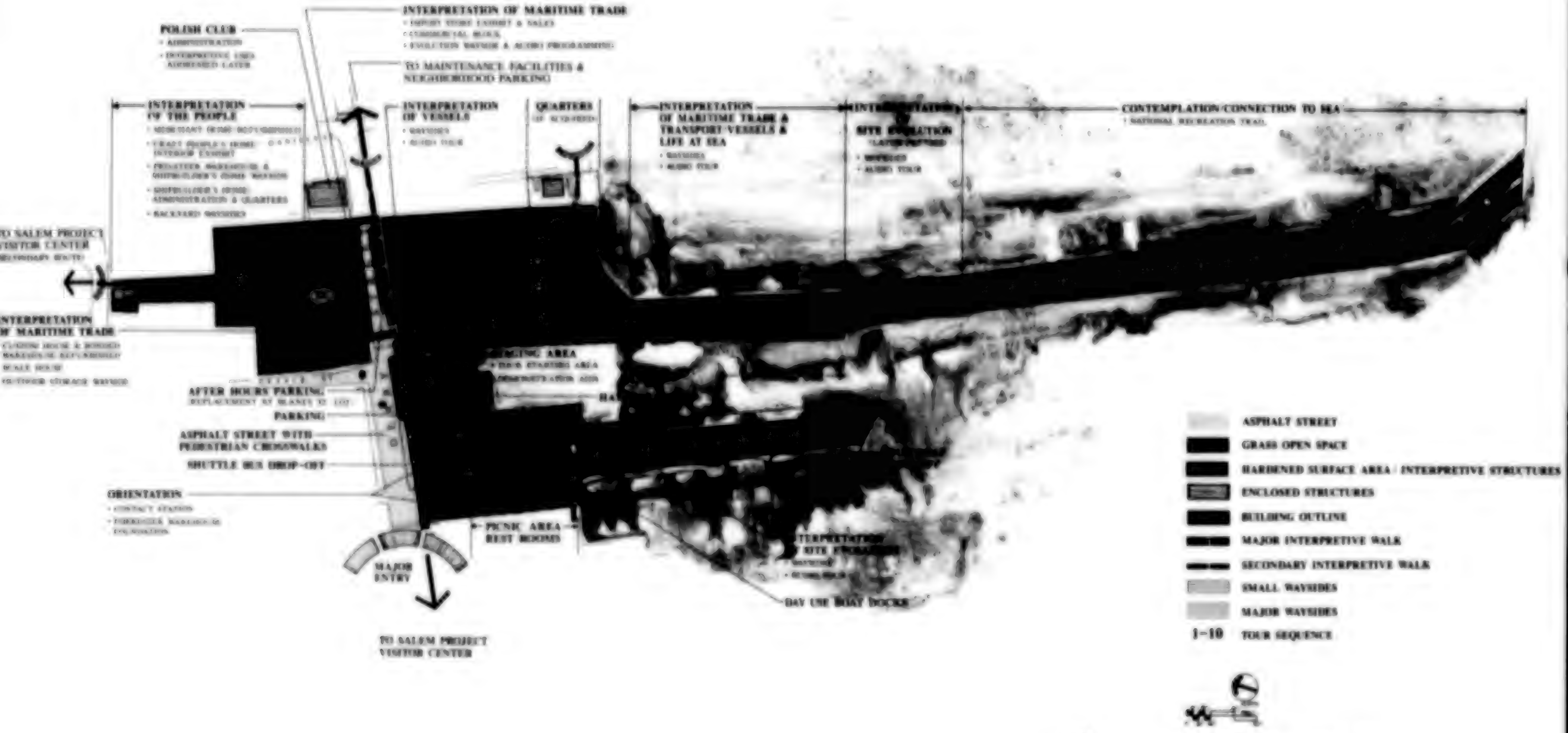
- Downtown parking and public transportation service would be the same as described for alternative 2.
- Derby Street would retain its existing pavement. Derby and Orange streets would be one-way, as described for alternative 2. The south side of Derby Street from the Custom House to Palfrey Street (15 spaces) would be closed to parking from 8 a.m. to 5 p.m., and an equal amount of replacement parking would be provided at a new lot approximately one-half mile from the site.
- A tour-boat drop-off would be located on the west side of Central Wharf, as in alternative 2.

Orientation and Support Facilities

- The contact station would be retained. New media would interpret the evolution of the site and maritime trade.
- The Forrester warehouse foundation would be used as a waiting area, but the structural outline of the building would not be ghosted, and this space would not provide shade or rain protection under this alternative. Waysides would be provided to orient visitors when the contact station was closed.



PERSPECTIVE
**ALTERNATIVE 3:
LOW-PROFILE
INTERPRETIVE MEDIA**


INTERPRETATION OF MARITIME TRADE
• IMPORT STORE EXHIBIT & SALES
• COMMERCIAL BLOCK
• EVOLUTION WAYSIDE & AUDIO PROGRAMMING
POLISH CLUB
• ADMINISTRATION
• INTERPRETIVE USES ADDRESSED LATER
TO MAINTENANCE FACILITIES & NEIGHBORHOOD PARKING
INTERPRETATION OF THE PEOPLE
• MERCHANT HOME REFURNISHED
• CRAFT PEOPLE'S HOME INTERIOR EXHIBIT
• PRIVATEER WAREHOUSE & SHIPBUILDER'S HOME WAYSIDE
• SHIPBUILDER'S HOME ADMINISTRATION & QUARTERS
• BACKYARD WAYSIDES
INTERPRETATION OF VESSELS
• WAYSIDES
• AUDIO TOUR
QUARTERS
INTERPRETATION OF MARITIME TRADE & TRANSPORT VESSELS & LIFE AT SEA
• WAYSIDES
• AUDIO TOUR
INTERPRETATION OF SITE EVOLUTION
• WAYSIDES
• AUDIO TOUR
CONTEMPLATION/CONNECTION TO SEA
• NATIONAL RECREATION TRAIL
TO SALEM PROJECT VISITOR CENTER
SECONDARY ROUTE
INTERPRETATION OF MARITIME TRADE
• CUSTOM HOUSE & BONDED WAREHOUSE REFURNISHED
• SCALE HOUSE
• OUTDOOR STORAGE WAYSIDE
STAGING AREA
• TOUR STARTING AREA
• DEMONSTRATION AREA
AFTER HOURS PARKING
REPLACEMENT AT BLANEY ST. LOT
PARKING
ASPHALT STREET WITH PEDESTRIAN CROSSWALKS
SHUTTLE BUS DROP-OFF
ORIENTATION
• CONTACT STATION
PICNIC AREA
REST ROOMS
MAJOR ENTRY
TO SALEM PROJECT VISITOR CENTER
INTERPRETATION OF SITE EVOLUTION
DAY USE BOAT DOCKS
ASPHALT STREET
GRASS OPEN SPACE
HARDENED SURFACE AREA / INTERPRETIVE STRUCTURES
ENCLOSED STRUCTURES
BUILDING OUTLINE
MAJOR INTERPRETIVE WALK
SECONDARY INTERPRETIVE WALK
SMALL WAYSIDES
MAJOR WAYSIDES
1–10 TOUR SEQUENCE

ALTERNATIVE 3: LOW-PROFILE INTERPRETIVE MEDIA

SALEM MARITIME NATIONAL HISTORIC SITE

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

LARGE WAYSIDE EXHIBIT

- The head of Hatch's Wharf would be furnished with a variety of interpretive aids, such as flagpoles, a mast, a spar, and a scale, and it would serve as a focal point for demonstrations of both shipboard and land-based maritime activities.

- The restrooms would remain on the north side of Derby Street, behind the Hawkes house.

Interpretive Media and Programs

- A mast, spar, rigging, and other interpretive aids would be installed on Hatch's Wharf to support a variety of demonstrations.

- Large waysides (20-40 feet long) on Derby Wharf would depict the wharf when it was lined with warehouses and a variety of ships were in the harbor. Other waysides would depict the historic shipbuilding area on the wharf.

- An audio tour utilizing portable individual receivers would be activated by various props on the wharves and would provide interpretive messages and sound effects designed to help people imagine the historic activities that occurred there.

- The historic buildings north of Derby Street would receive new exhibits as in alternative 1.

Recreation

- A shady picnic area would be provided as in alternative 2.

- The west side of Central Wharf would be used for day-use boat docking. Mooring of boats between Derby and Central wharves would be discontinued, as in alternative 2.

- The majority of the site would remain in open space available for special performances and spontaneous play.

- The two deteriorated piers on Derby Wharf would be removed.

Wharf Rehabilitation and Dredging

- No dredging would occur.

- The wharves would be rehabilitated as described for alternative 1.

Maintenance Facilities

- Maintenance facilities would be developed off site, the same as in alternative 2.

ALTERNATIVE 4: MUSEUM/RECREATIONAL USE

Alternative 4 would seek to convey the spirit of the maritime era through major media presentations and demonstrations, which would be consolidated into a large new museum on Derby Wharf. A major function of the museum would be interpretation of period vessels and life at sea. In this alternative, however, the vessels would be sheltered in a large structure, which would avoid the problems of maintaining waterborne vessels and allow for year-round enjoyment by visitors. The museum would be a clearly contemporary structure but would be designed to represent the height and length of two adjacent warehouses that would have existed historically on the wharf, with a large addition at the back. Outside, a "ship deck" on piles and ghosted vessels would convey the feeling of tall ships tied up along Derby Wharf without requiring dredging along Derby. The impression of a busy harbor filled with ships would be further conveyed by a program of visiting wooden sailing vessels, which would require dredging along Central Wharf, and by allowing sailing vessels and a tour boat to dock during the daytime along the middle section of Derby Wharf. Water-oriented recreation would be accommodated to a greater extent in this alternative than in any of the others by allowing this boat docking on both Derby and Central wharves. The visitor experience would be improved as follows.

Visitor access would be similar to that described for alternatives 2 and 3. In this alternative, however, visitor contact services would be relocated to the new museum, where they could be more efficiently operated as part of the major interpretive program in that facility. This would place these services near the point where visitors would arrive by boat, but several hundred yards from the point of entry for visitors arriving on foot or by tour bus.

As in alternative 2 the interpretive exhibits in the museum would encourage visitors to use all their senses – to see, feel, hear, and smell what it must have been like on a trading vessel or Derby Wharf during the height of the maritime era. Ship exhibits would be stressed. Representations of parts of a vessel or vessels and other media would be used to interpret naval architecture and life at sea. Other exhibits might show the functions of the warehouses. Demonstrations would invite visitor participation in shipboard activities, cargo handling, and other aspects of maritime trade. The museum could incorporate a great variety of tangible expressions, demonstrations, interactive media, and other media necessary to convey the spirit and significance of the maritime era.

Derby Street and the buildings to the north would be linked visually and interpretively to the wharves in a manner similar to alternative 2.

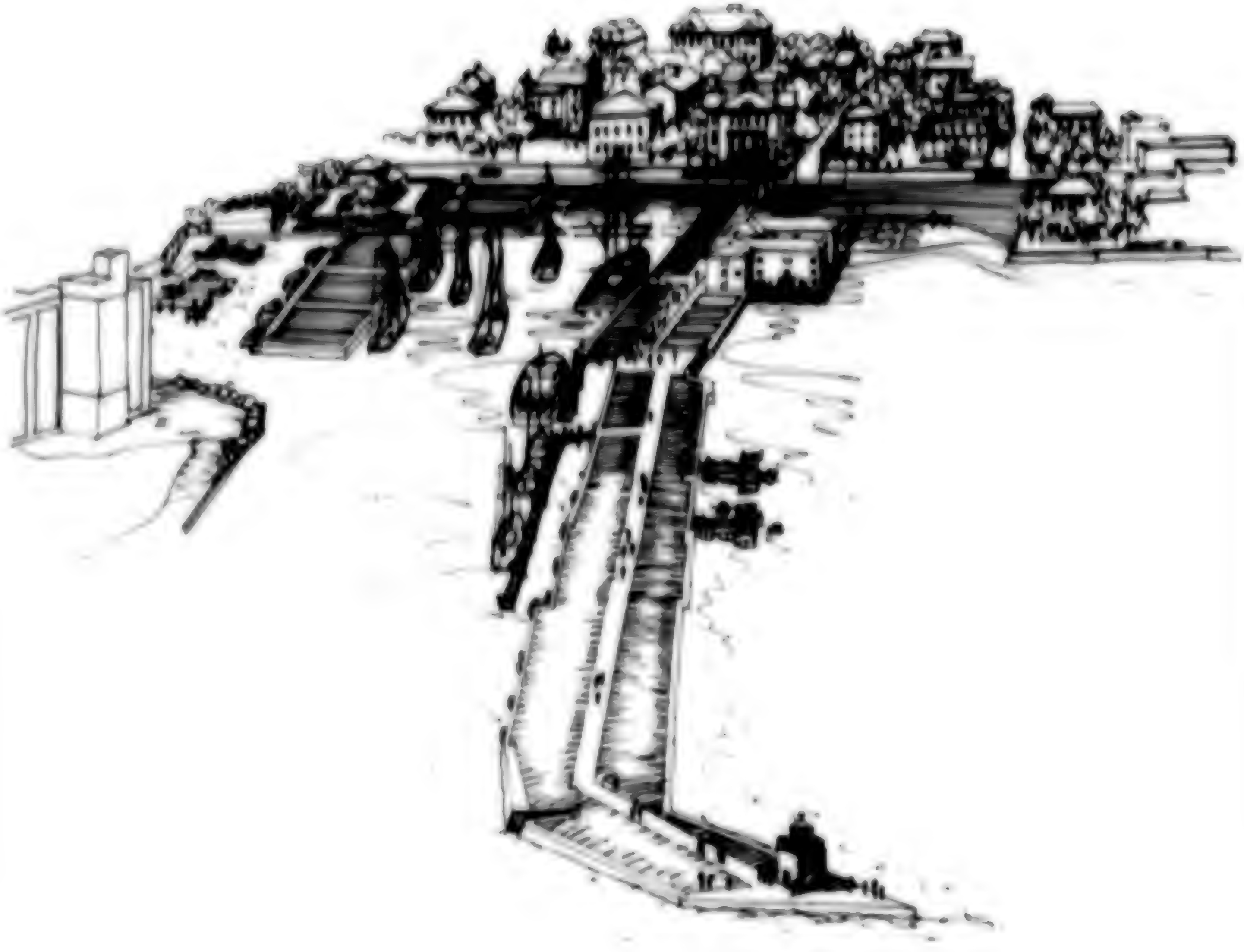
Maintenance functions would be relocated off the site the same as in alternative 2.

Access and Circulation

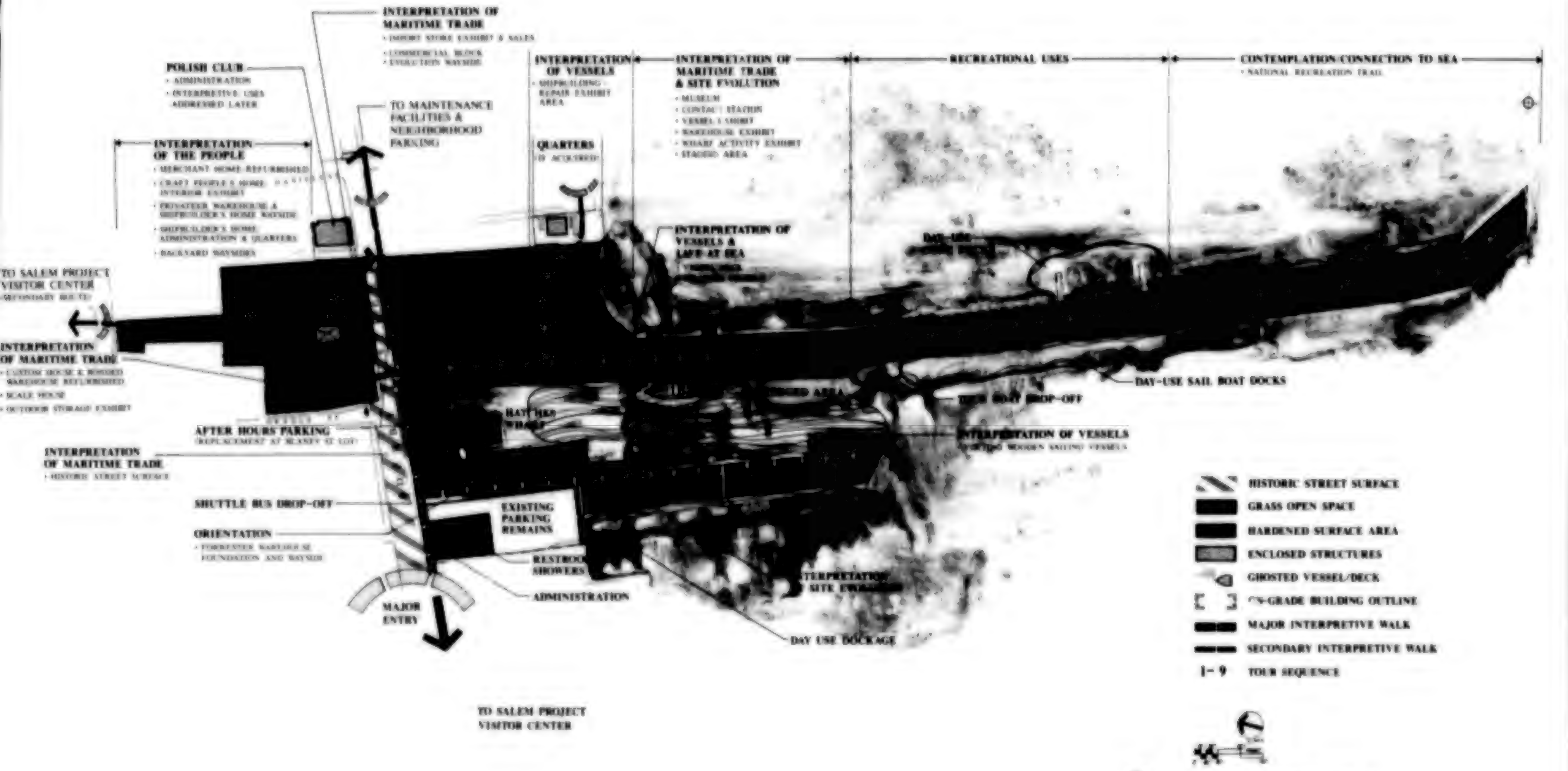
- Downtown parking and visitor shuttle bus service would be the same as described in alternative 2.
- In addition to downtown parking, the on-site parking lot would remain and would be managed for park visitors.
- A tour boat drop-off would be located in the middle of Derby Wharf, near the museum.
- Derby Street would have parking restrictions and a more historic appearing pavement, as in alternative 2.

Orientation and Support Facilities

- The same kinds of visitor contact facilities described for alternative 2 (including new media to interpret the evolution of the site and introduce the other interpretive themes and a gathering space for demonstrations) would be consolidated in a new museum on Derby Wharf. The existing contact station would be turned into an administrative facility. Hatch's Wharf would remain grassy open space. The Forrester warehouse foundation would have waysides added to allow for visitor contact and



PERSPECTIVE
ALTERNATIVE 4:
MUSEUM / RECREATIONAL USE

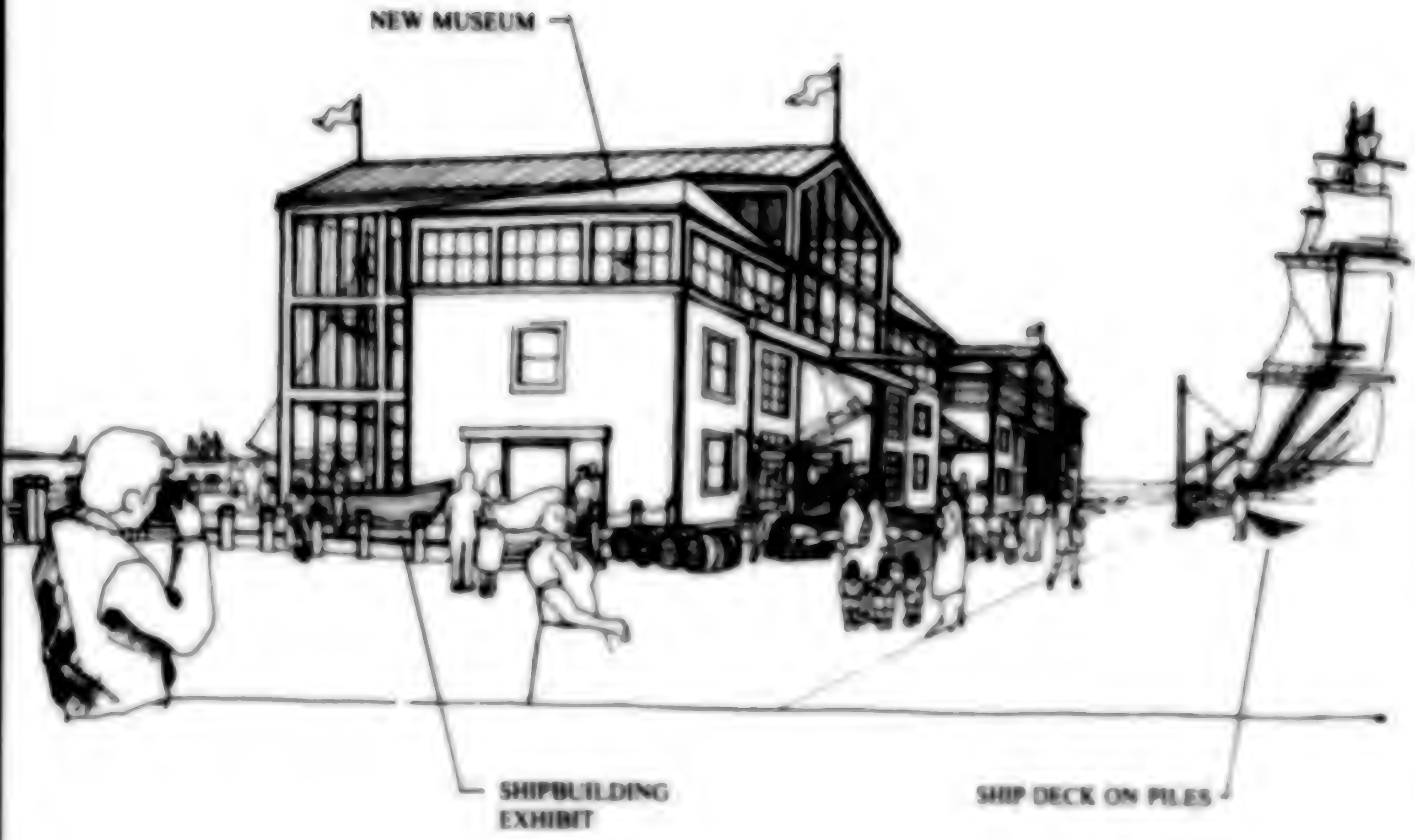

INTERPRETATION OF MARITIME TRADE
· IMPORT STORE EXHIBIT & SALES
· COMMERCIAL BLOCK
· EVOLUTION WAYSIDE
POLISH CLUB
· ADMINISTRATION
· INTERPRETIVE USES ADDRESSED LATER
TO MAINTENANCE FACILITIES & NEIGHBORHOOD PARKING
INTERPRETATION OF VESSELS
· SHIPBUILDING - REPAIR EXHIBIT AREA
QUARTERS
(IF ACQUIRED)
INTERPRETATION OF MARITIME TRADE & SITE EVOLUTION
· MUSEUM
· CONTACT STATION
· VESSEL EXHIBIT
· WAREHOUSE EXHIBIT
· WHARF ACTIVITY EXHIBIT
· STAGING AREA
RECREATIONAL USES
CONTEMPLATION/CONNECTION TO SEA
· NATIONAL RECREATION TRAIL
INTERPRETATION OF THE PEOPLE
· MERCHANT HOME REFURBISHED
· CRAFT PEOPLE'S HOME INTERIOR EXHIBIT
· PRIVATEER WAREHOUSE & SHIPBUILDER'S HOME WAYSIDE
· SHIPBUILDER'S HOME ADMINISTRATION & QUARTERS
· BACKYARD WAYSIDES
INTERPRETATION OF VESSELS & LIFE AT SEA
DAY-USE
TO SALEM PROJECT VISITOR CENTER
(SECONDARY ROUTE)
INTERPRETATION OF MARITIME TRADE
· CUSTOM HOUSE & BONDED WAREHOUSE REFURBISHED
· SCALE HOUSE
· OUTDOOR STORAGE EXHIBIT
HATCHES WHARF
WOODED AREA
DAY-USE SAIL BOAT DOCKS
TOUR BOAT DROP-OFF
INTERPRETATION OF VESSELS
· WORKING WOODEN SAILING VESSELS
AFTER HOURS PARKING
(REPLACEMENT AT BLANEY ST LOT)
INTERPRETATION OF MARITIME TRADE
· HISTORIC STREET SURFACE
SHUTTLE BUS DROP-OFF
EXISTING PARKING REMAINS
ORIENTATION
· FORRESTER WAREHOUSE FOUNDATION AND WAYSIDE
RESTROOMS SHOWERS
ADMINISTRATION
INTERPRETATION OF SITE EVOLUTION
DAY USE DOCKAGE
MAJOR ENTRY
TO SALEM PROJECT VISITOR CENTER
▨ HISTORIC STREET SURFACE
■ GRASS OPEN SPACE
■ HARDENED SURFACE AREA
▨ ENCLOSED STRUCTURES
GHOSTED VESSEL/DECK
[ ] ON-GRADE BUILDING OUTLINE
MAJOR INTERPRETIVE WALK
SECONDARY INTERPRETIVE WALK
1 - 9 TOUR SEQUENCE

ALTERNATIVE 4: MUSEUM / RECREATIONAL USE

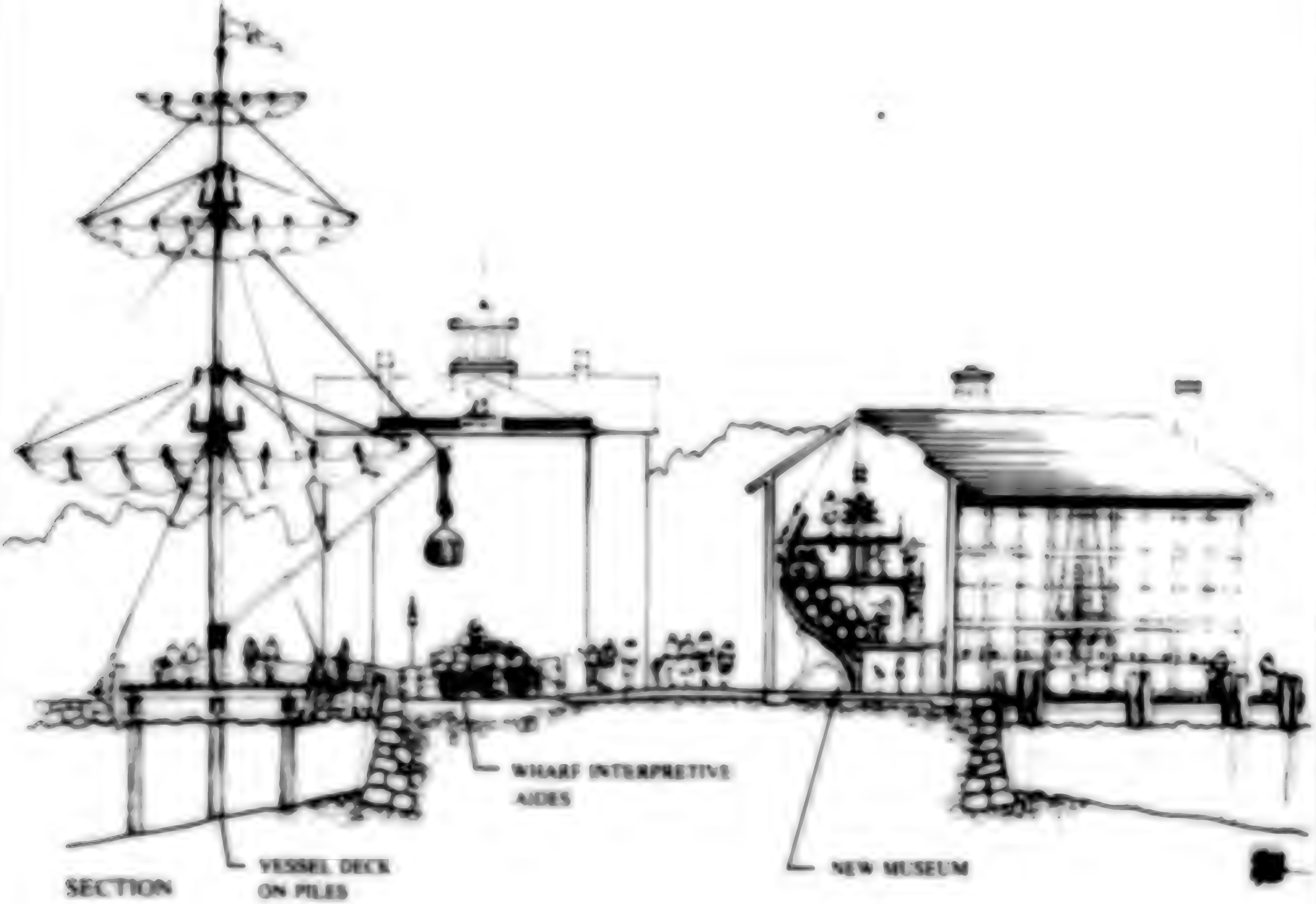
SALEM MARITIME NATIONAL HISTORIC SITE

UNITED STATES DEPARTMENT OF THE INTERIOR · NATIONAL PARK SERVICE

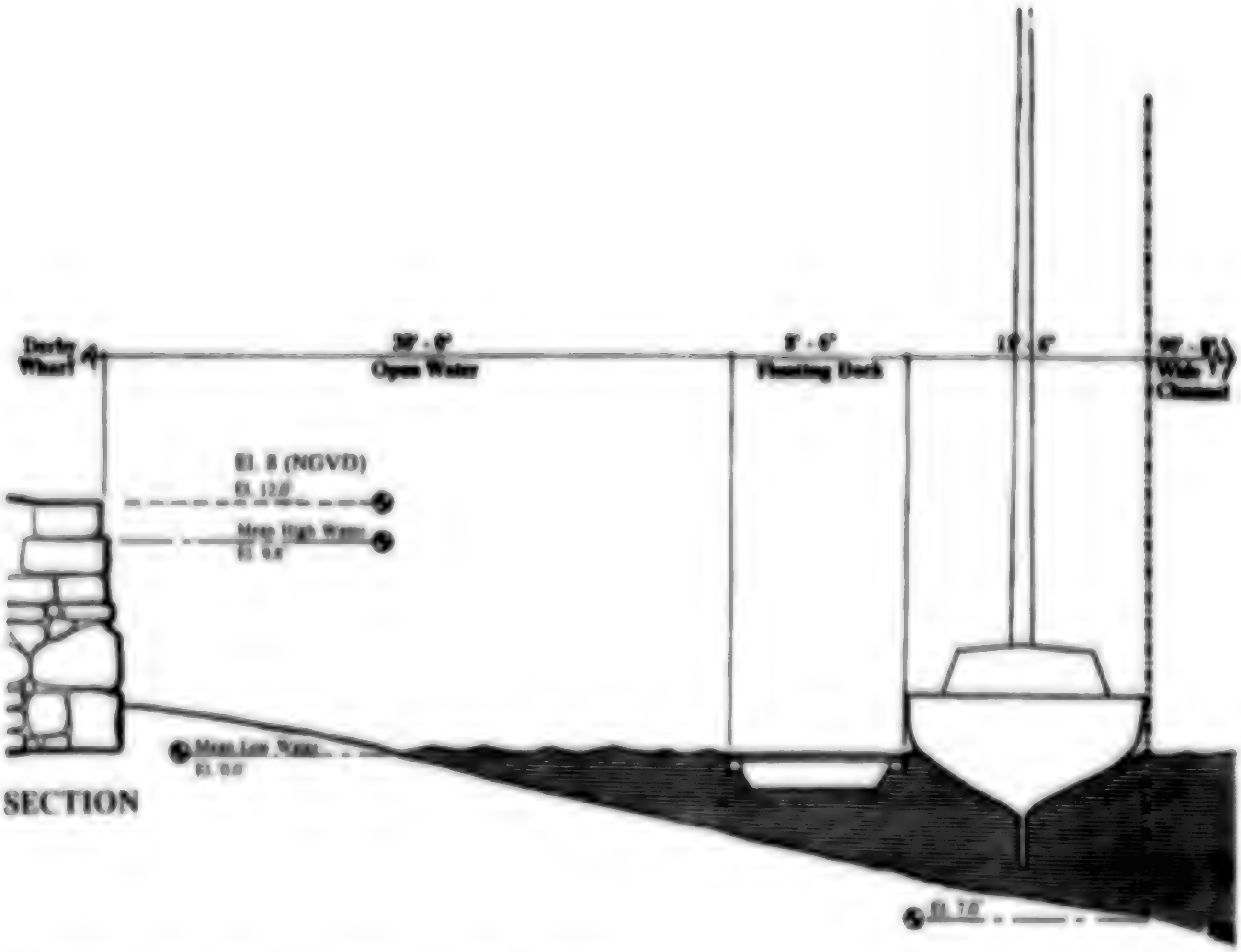
BLANK PAGE



DERBY WHARF MUSEUM



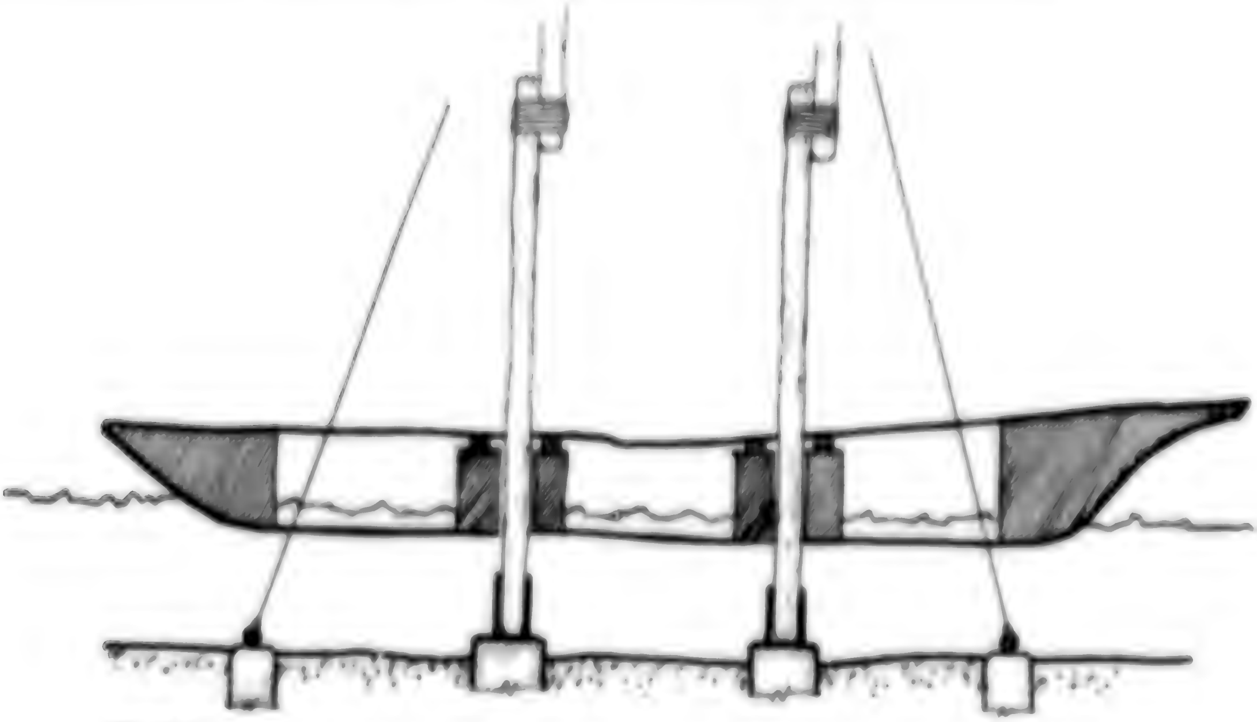
DERBY WHARF
MUSEUM SECTION



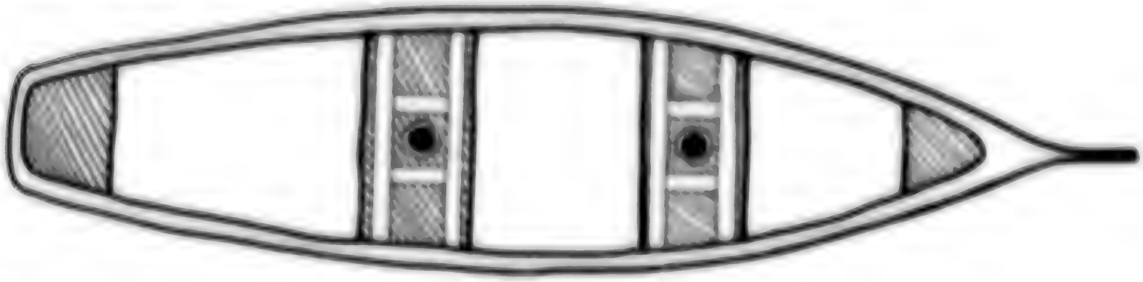
SECTION

Note: This section is taken at a distance of 500' to the south of Old Derby Wharf. It illustrates the existing grading, showing that no dredging is required to dock sailing craft against a floating dock system. The existing depth accommodates up to a 6'-3" draft – that of a cruising class vessel such as a Pearson 32 or CS 36.

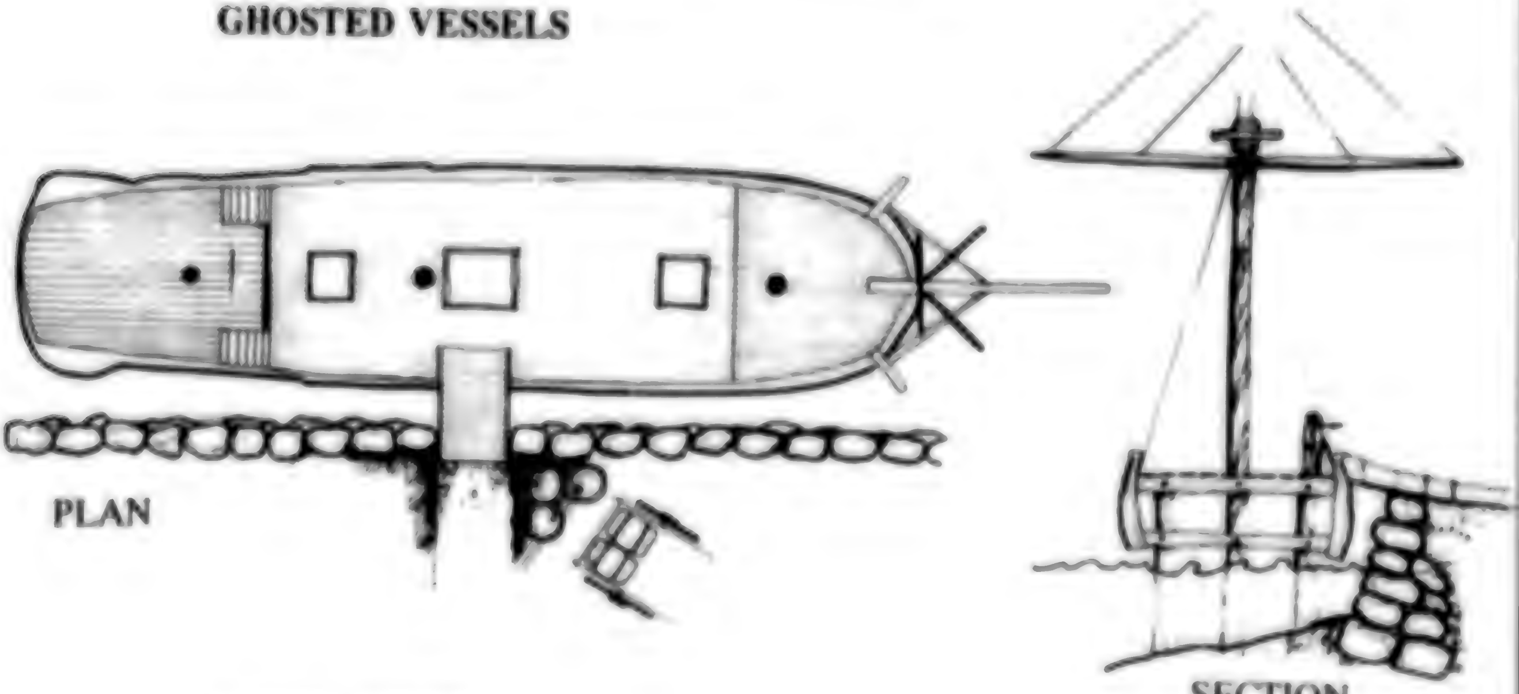
DERBY WHARF
DAY USE DOCK



SECTION



GHOSTED VESSELS



PLAN

SECTION

VESSEL DECK

orientation when the museum was closed.

- Public restrooms would be built on Central Wharf. A shower facility would be included to serve the crews of visiting wooden sailing vessels.

Interpretive Media and Programs

- A museum built on Derby Wharf would contain visitor contact facilities (see above) and major media, including representations of vessel and warehouse interiors, interactive computer programs, and audiovisual presentations. The park staff would provide demonstrations of warehouse and wharf activities in the museum building.
- A ship's deck would be constructed directly across the wharf from the museum building. The deck would be a wooden structure on piles in the water with masts, spars, sails, and a few of a ship deck's detailed elements, such as the ship's wheel and compass. This structure would be used to demonstrate cargo movement and transport, shipboard activities, and outdoor ship maintenance operations.
- Ghosted vessels would be placed in the shallow area of the harbor between Derby and Central wharves. These would be floating skeletons that could not be boarded.
- The shipbuilding and repair exhibit area would serve the same interpretive function as in alternative 2 but would be located adjacent to the Derby Wharf museum.
- Docks for special wooden sailing vessels would be provided along the east side of Central Wharf as in alternative 2.
- The uses and programs for the buildings north of Derby Street would be the same as in alternative 2.
- Open space would exist at the tip of Derby Wharf.

Recreation

- Day-use docks for modern sailboats and dories would be provided along the central portion of Derby Wharf and the entire west side of Central Wharf. The floating docks off Derby Wharf would be approximately 30 feet from the wharf's edge to preserve the wharf wall yet provide adequate water depth for a variety of sailing boats. The two existing piers on the east side of Derby would be repaired and designed for day-use dory docking.

Wharf Rehabilitation and Dredging

- Dredging would occur along the east side of Central Wharf from the marine railway to the south end to accommodate a variety of visiting vessels with drafts up to 12-13 feet. Central Wharf would be rehabilitated as described for alternative 2.
- No dredging would be required along Derby Wharf. Seepage of seawater into Derby and Hatch's wharves would be remedied as described for alternative 1.

Maintenance Facilities

- Maintenance facilities would be provided off site the same as in alternative 2.

TABLE 1: SUMMARY COMPARISON OF ALTERNATIVES

	Alt. 1: No Action	Alt. 2: Three-Dimensional Form	Alt. 3: Low-Profile Media	Alt. 4: Museum/ Recreation
DESCRIPTION				
Access and Circulation	On-site visitor parking (approximately 44 spaces)	Centralized downtown parking, shuttle service; Central Wharf lot removed, 22 spaces on Derby Street closed to day parking and equal replacement parking provided within ½ mile; one-way traffic on Derby (eastbound) and Orange (northbound)	Centralized downtown parking, shuttle service; Central Wharf lot removed, 15 Derby Street spaces closed to day parking and equal replacement parking provided within ½ mile; one-way traffic on Derby and Orange	Centralized downtown and on-site visitor parking (44 spaces total), shuttle service, 22 spaces on Derby Street closed to day parking and equal replacement parking provided within ½ mile; one-way traffic on Derby and Orange
Visitor Contact	Salem Project orientation, introduction to historic site at downtown visitor center	Same as alternative 1	Same as alternative 1	Same as alternative 1
	Central Wharf contact station	Central Wharf contact station and staging area, outdoor orientational exhibits; ghosted Forrester warehouse waiting area	Same as alternative 2 except Forrester warehouse not ghosted	Orientation and staging functions consolidated at museum
Interpretation	Derby Wharf: waysides; open space	Derby Wharf: reconstructed ship, new warehouse-exhibit structures (1-2 buildings, ghosted structures, low building outlines), waysides, wharf interpretive aids; shipbuilding exhibit, open space	Derby Wharf: large waysides, audio tour; open space	Derby Wharf: museum; outdoor ship deck exhibit, wharf interpretive aids; ghosted vessels; shipbuilding exhibit
	Central Wharf: waysides; open space	Central Wharf: visiting wooden sailing vessels, waysides, open space	Central Wharf: waysides; open space	Central Wharf: same as alternative 2
	Derby Street: modern city street	Derby Street: historic pavement	Derby Street: same as alternative 1	Derby Street: same as alternative 2

	Alt. 1: No Action	Alt. 2: Three-Dimensional Form	Alt. 3: Low-Profile Media	Alt. 4: Museum/ Recreation
	North Area: historic structures, waysides	North Area: same as alternative 1 plus bonded warehouse yard interpretive aids and backyard waysides	North Area: same as alternative 1	North Area: same as alternative 2
Recreation	Opportunities for spontaneous activities and open space recreation, boat docking on Central Wharf, dory docking on Derby Wharf; picnic area in parking lot	Opportunities for spontaneous activities and open space recreation, boat docking and tour-boat drop-off on Central Wharf; landscaped picnic area	Same as alternative 2	Same as alternative 2 except tour-boat drop-off and sailboat and dory docking on Derby Wharf
Maintenance	Scattered in historic structures	Consolidated off site	Same as alternative 2	Same as alternative 2
IMPACTS				
Cultural Resources	Hazards to historic buildings and collections caused by storage of maintenance materials; adverse visual impact caused by parking on Central Wharf	No adverse effect on any resources unless the Essex Street property was used for maintenance, in which case there would be an adverse effect on four registered properties in a historic district	Same as alternative 2	Adverse visual effect on Derby Wharf associated with large new museum structure and docks; continuation of adverse visual effect due to parking lot on Central Wharf; same potential for effect on the Essex Street property as alternative 2
Natural Resources	No effect	Disturbance of 17,600 cubic yards of marine sediments with localized, short-term decrease in water quality; no adverse effect on marine life; no adverse effect associated with dredge disposal	No disturbance of marine sediments or marine life	Similar to alternative 2, but disturbance caused by dredging reduced by about one-third

	Alt. 1: No Action	**Alt. 2: Three-Dimensional Form**	**Alt. 3: Low-Profile Media**	**Alt. 4: Museum/ Recreation**
		Construction of interpretive and maintenance facilities in the 100-year floodplain, no effect on floodplain values or wetlands	Construction of maintenance facilities in the 100-year floodplain, no effect on floodplain values or wetlands	Same as alternative 2
Interpretive Experience	Weak visitor sense of maritime history; focus on form and function of Custom House, store, and residences with weak linkages to wharves and harbor	Focus on three-dimensional tangible forms; visitor use of all senses; balance of mass from north to south; unity of park elements, emphasis on participation and involvement	Focus on two-dimensional artistic images, audio media, and park interpreters; difficult for some to translate two-dimensional images into three-dimensional form; weak visual connection between different park elements	Focus on museum interior exhibits; difficult connection between different park elements
Recreational Experience	No effect	Minor displacement of open space recreation and loss of dory pier docking and mooring opportunities	Loss of dory pier docking and mooring opportunities	Minor displacement of open space recreation; increased opportunities for boat docking; loss of mooring opportunities
Visitor Access	Inadequate visitor parking on site, no organized visitor parking off site	Adequate visitor parking downtown with shuttle service to park	Same as alternative 2	Adequate visitor parking downtown plus some on-site parking
Neighborhood	Traffic congestion and competition for neighborhood parking space	Reduced traffic congestion and competition for neighborhood parking space; longer walk for neighborhood residents to new parking lot	Same as alternative 2	Traffic and parking congestion associated with on-site visitor parking lot the same as alternative 1; longer walk for neighborhood residents to new parking as in alternative 2

ALTERNATIVES CONSIDERED BUT REJECTED

Alternatives for Vessel Interpretation

A number of different alternatives for vessel interpretation were considered. In addition to the alternatives analyzed in this document, they included

a cut-away of a vessel in water

a barge designed in the shape of a period vessel deck with representative ship deck elements

a floating vessel exhibit

a visiting vessel stationed on site

A barge or cut-away vessel would provide generally the same visitor experience as the ship deck exhibit and ghosted vessels analyzed in alternative 4 but would be more expensive to maintain. Therefore, they were rejected in favor of the simpler solutions.

A floating vessel exhibit would provide a visitor experience similar to the experience of a reconstructed vessel. However, people who are knowledgeable of ships, of which there are many in New England, do not favor this approach and refer to it as generalizing and trivializing the essence of a ship.

None of the existing reconstructed vessels would adequately meet requirements of the Salem Maritime interpretive program. They either do not date from the appropriate period, do not relate to maritime trade, have been modernized below decks, are too small to support an adequate interpretive program, or some combination of the above. In addition, these vessels are intended to be sailed by their owners/operators. Docking at pier side for the long periods of time needed to meet the park's interpretive program would be inconsistent with the ways these vessels are intended to be used and would interfere with how the owners generate income to support the vessels. The existing vessels are described in the "Description of the Environment."

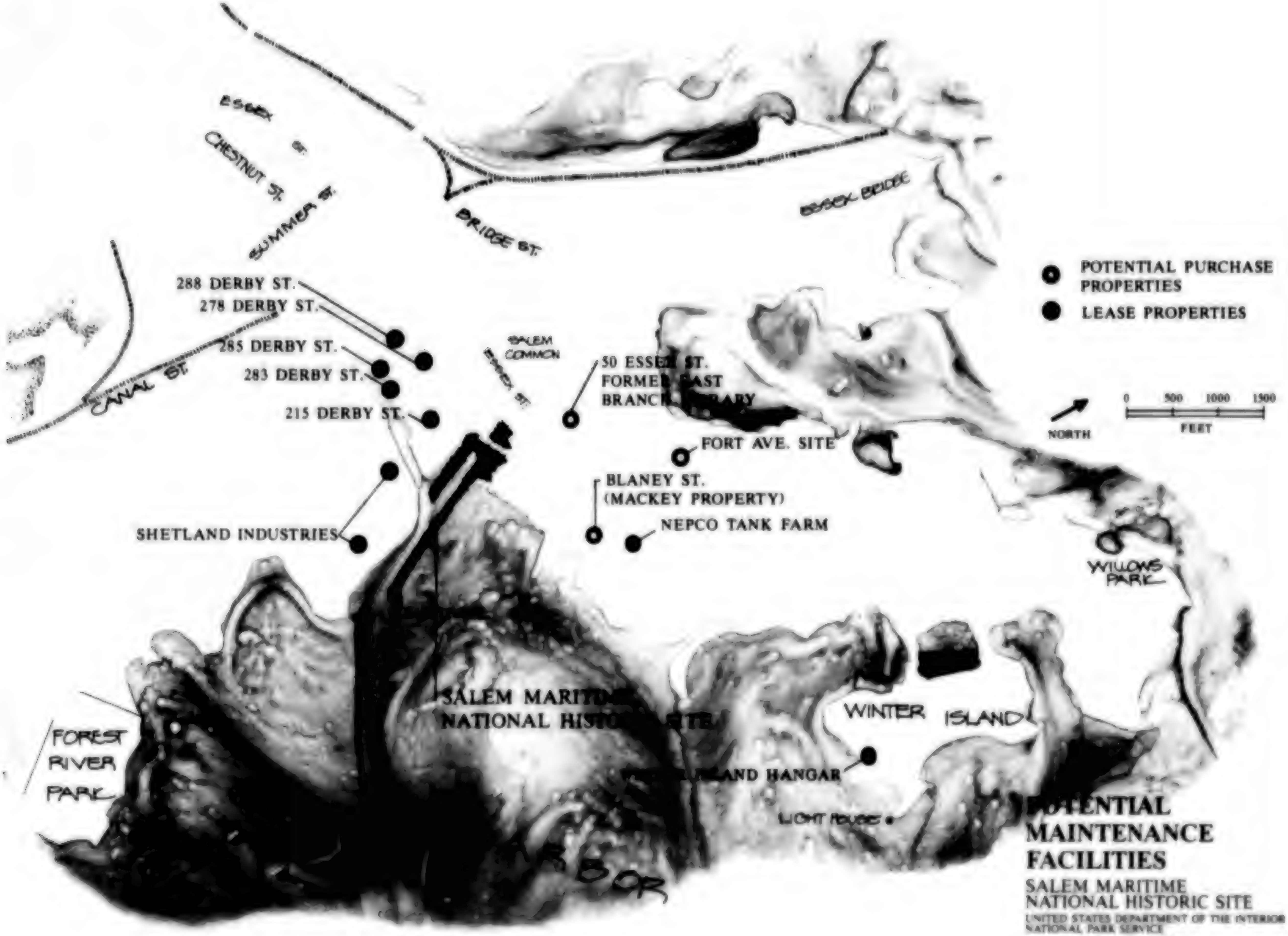
Alternative Parking Sites

Alternative off-site parking areas were analyzed during preparation of the plan to determine the feasibility of relocating parking off the site. Ten areas within a one-half mile radius of the site were considered, and three initially appeared to be possible alternatives. These included the Blaney Street property, a lot on Herbert Street within a few hundred yards of the west site boundary, and an empty lot at Congress and Derby streets owned by the Southland Corporation. The Herbert Street lot and Southland lot were subsequently found to be unsuitable for use by the National Park Service because of their planned use by Pickering Wharf to help meet their parking needs.

Alternative Maintenance Sites

In addition to the possible off-site maintenance locations included in the planning alternatives, seven additional properties within one-half mile of the historic site were considered but rejected because of problems with their size, location, condition, or availability. All the sites considered are shown on the Potential Maintenance Facilities map.

BLANK PAGE

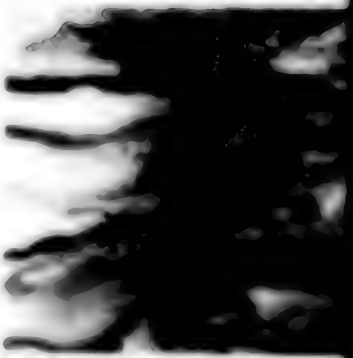


POTENTIAL MAINTENANCE FACILITIES

SALEM MARITIME
NATIONAL HISTORIC SITE
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
373 • 40,031A • DSC • FEB 91

BLANK PAGE

■ PART THREE:
DESCRIPTION OF THE ENVIRONMENT



BLANK PAGE

CULTURAL ENVIRONMENT

An in-depth analyses of the park's cultural resources, including remote sensing and archeological testing, was conducted as part of this study by Louis Berger & Associates (1986b) under a contract with the National Park Service. Data about the development of the site's historic structures and about its archeological resources are summarized below.

The Wharves

Few earth-filled wharves, a unique product of the American experience, survive today. Derby, Central, and Hatch's wharves are nationally significant as engineering achievements and as cumulative products of Salem's maritime heritage. The wharves are closely associated with the mercantile activity that was the source of Salem's wealth in its heyday.

Central Wharf. By 1784 a wharf believed to be of cobb construction was standing on the site of present-day Central Wharf. Between 1791 and 1804, merchant Simon Forrester completely rebuilt the wharf in solid timber construction and enlarged it to a length of 273 feet, also constructing a warehouse in 1792. By 1820 Forrester had added a timber cobb extension resulting in a 795-foot-long structure. Buildings gradually appeared between 1820 and 1851, including the brick Forrester warehouse (by 1832), a coal shed, a two-story wooden warehouse, and a one-story wooden warehouse.

Central Wharf was rebuilt several times. In 1896 George Lane lengthened the wharf from 795 to 800 feet and widened it 8 feet by sinking piles outside the original cobb work. The 1805-20 cobb wharf was thus enclosed in a new timber shell. The National Park Service undertook the next rebuilding in 1938, driving new piles, installing timber sheeting, and adding tie rods and anchors. Piles were driven 5 feet on center approximately 2 feet outside the previous structure. The last major alteration dates to 1975, when the Park Service added the steel sheet bulkhead wall along the west face, a project that did not re-create the historic appearance of the wharf.

In 1947 the Navy was allowed to construct, maintain, and operate a Naval Reserve Training Center on Central Wharf. The Navy building has since been demolished. The 1805 warehouse now standing on Central Wharf was once located on Front Street in Salem and was moved to the wharf in 1977.

Hatch's Wharf. Elias Hasket Derby acquired the property now known as Hatch's Wharf in 1793. Derby improved an existing wharf on the site in 1795, the result being a bottle-shaped structure of timber cobb construction. In 1853 lumber merchants Lemuel B. Hatch and Daniel P. Fitz rebuilt the wharf to its present rectangular form and added the stone facing. By 1874 Hatch had erected a coal shed on the wharf. His office was located adjacent to the shed with frontage on Derby Street.

Derby Wharf. This great timber wharf, faced with stone seawalls, was the largest and most important mercantile and maritime facility standing in Salem's harbor from 1770 to 1845. The original portion of the wharf was constructed between 1764 and 1771 by Richard Derby to a length of 803 feet. Derby family members extended the wharf in 1806-8 to 2,093 feet, and over time the structure was faced with stone. Beginning in 1765 a series of 22 warehouses were constructed on Derby Wharf, extending out to the end. Thirteen of these warehouses (five on the original wharf and eight on the 1806-8 extension) originally stood on piles along the eastern side of the wharf. In 1830 the Derby Wharf Corporation authorized these warehouses to be moved westward and placed in a line atop the wharf. Subsequent maps show the warehouses in their new locations. By the mid 1930s all of these buildings were gone. A lighthouse built on the tip of the wharf in 1871 is the only building still standing. In 1938 the National Park Service substantially reconstructed Derby Wharf, taking care that the exterior facade conformed to its previous appearance.

Derby Beach. The area east of Derby Wharf was described as "Beach Land and Flatts" when it was acquired by Richard Derby in 1762. That year Derby began a filling operation which was taken up again in 1789 by his son Elias Hasket. Land filling continued, and by 1897 the waterfront line had advanced to a point 382 feet south of Derby Street. Benjamin Hawkes repaired boats and later built ships in this area roughly from 1790 to 1830. By the 1930s a number of tenements, a Polish social club, and a bakery occupied this part of the site.

Two lots in private ownership remain inside the site boundary, east of Derby Beach. One of these lots, which is undeveloped, will be acquired by the National Park Service and will be kept as open space. The other lot contains a condominium that would be suitable for park housing if acquired.

Archeological Resources. The wharves have been repeatedly repaired and reconstructed. Dredged materials from the harbor and imported fill were both used in past wharf renovations. This ongoing process has mixed artifacts from different periods and places and removed older sections of the wharves. Portions of the wharves, however, may have been preserved through encapsulation in the new bulkheads, such as occurred on Central Wharf. Such may also be the case with areas where disturbance is known to have ceased after a particular period. For instance, occasional remnants of the piles that once supported buildings along the east side of Derby Wharf might be undisturbed. It is likely that repeated channel dredging has disturbed the archeological context within the seaward portion of the site to within a few feet of the wharves.

Hatch's Wharf, last remodeled in 1853, may contain valuable wharf construction features and associated artifacts dating to perhaps the 18th century. The lower portion of Derby Wharf at the lighthouse, and sections of older wharf cribs that now lie below water line and below previous repair efforts on all three wharves may also yield additional information about wharf construction and materials. Early utility systems and drains of unknown course and construction underlie the site. Deeply buried remains of earlier structures might exist in these areas. Remote sensing and shovel testing (Louis Berger and Associates 1990a, 1990c, and 1990d) south of Derby Street suggest the presence of some scattered historic features whose extent and condition are currently unknown.

Derby Street

Derby Street was laid out in 1764, had assumed its present width in front of the Custom House by 1795, and was treated with crushed stone in 1859 if not before. On occasions when the street is opened for repairs, granite paving stones are visible below the present asphalt surface.

While the upper soil levels along Derby Street at the head of all three wharves may have been disturbed, the lower, older portions of the street may contain remnants of early waterfront development, including portions of the wharves.

North Area

The area north of Derby Street contains a number of historic structures. The surrounding grounds have been significantly altered through time and do not represent the historic landscape during the time periods represented by the structures.

Custom House Complex. The Custom House (1819) was where merchants paid customs taxes, then a large part of the U.S. revenue. The interior of this structure has been selectively refurnished. The bonded warehouse (1819) at the rear of the Custom House was used to store goods until customs taxes were paid. This building still contains the pulley system that connected four floors of the warehouse. The interior of this building has been redesigned to include more cargo items. The scale house (1829) sheltered large scales used by the U.S. Customs Service. This structure contains various scales. Goods related to the bonded warehouse were once stored on the grounds behind the Custom House, and small outbuildings once occupied the rear of the Custom House lawn. Fuel tanks are buried along the east side of the lot. The rear yard of the bonded warehouse is relatively intact for archeological purposes.

Hawkes House. The Hawkes house (1780, remodeled 1801) was used as a privateering warehouse by Elias Hasket Derby and converted to a residence by shipbuilder Benjamin Hawkes. Today it is adaptively used for the park offices and employee quarters. Until 1838 the Hawkes house backyard was free of structures; tenement buildings were later constructed there. The present landscaping shared by the backyards of the Hawkes, Derby, and Narbonne houses is the work of the National Park Service and dates primarily from the 1930s. In the 1930s the foundations of structures behind the Hawkes and Derby houses and the West India Goods Store were dug out, and the site was graded and filled.

Derby House. The Derby house (1762), the oldest brick residence in Salem, was built by merchant Richard Derby for his son Elias Hasket, who became a stellar figure in Salem trading and shipbuilding. It has been refurnished to reflect the 1775 life-style of Elias Hasket Derby. Definitive evidence of what was in the Derby house backyard is not available, but during Elias's occupancy it probably contained a kitchen garden and a barn and/or sheds.

Narbonne House. The Narbonne house (c. 1672) served over the years as the home and shop for such craftsmen and tradesmen as a slaughterer and tanner, a ropemaker, and a cent-shop proprietor. It contrasts with the Derby and Hawkes houses in that it dates from an earlier settlement period and was the home not of a wealthy person, but of a series of artisans, laborers, and shopkeepers important to a maritime economy. The Narbonne house grounds were surveyed for archeological resources and found to contain remnants of a number of outbuildings, a well, and a prehistoric shell midden (NPS 1982a). This is the only formal archeology that has been done in the north area.

West India Goods Store. The West India Goods Store (c. 1800) was where imported cargoes were sold at retail. It was first documented as being used as a commercial enterprise in 1837. Today it is operated by the Eastern National Parks and Monuments Association. It currently stocks and sells items representing the countries with which Salem traded in her maritime heyday. Guidelines for sales and exhibit items representing an 1840s store are being developed by the park and will direct future sales items.

Polish Club. The Polish Club (1909) was a gathering place for the Polish immigrant community.

Vessels

No original or reconstructed ships dating from 1760-1830 would adequately meet the needs of the park. Maritime experts at the National Park Service, the National Trust for Historic Preservation, the National Maritime Historical Society, the Maine Maritime Museum, the Newport Museum of Yachting, Mystic Seaport, the Philadelphia Maritime Museum, and the American Sail Training Association were contacted regarding the availability of an extant or reconstructed vessel from the 1760-1830 historic period suitable for interpretation at Salem. Only two extant ships from this period are known – the *Constitution* and the *Charles W. Morgan* – and neither is available.

The availability of reconstructed vessels from the 1760-1830 period was checked using the *Directory* of the American Sail Training Association, which lists 92 vessels, and word of mouth references. Investigations to date indicate that the owners/operators of four period vessels (listed below) would be interested in docking at Derby Wharf.

> *Glad Tidings* (late 18th century brigantine, roughly 65 feet long): The owner would be interested in docking at Derby Wharf from mid-July through Labor Day, which is shorter than the site's prime visitor season of April to October. The ship is not representative of international trading vessels of the period, is small, and has been modernized below deck. It would be a good addition to the visiting wooden sailing vessel program, but it would not be a main attraction and would only be able to tell the seamanship part of the interpretive story. The owner wants limited visitation, so the vessel would be primarily a visual element.
>
> *Ernestina* (late 19th century fishing schooner): This vessel does not date from the primary period of maritime significance and was never used as a merchant vessel. It generates $300,000 of its $600,000 operating budget by taking passengers on sails and therefore cannot spend much time in port. It currently sails from April to October.
>
> *Robert Howard* (brigantine of the 1760-1830 period, 47 feet long on deck): Like the *Glad Tidings* this vessel has been modernized below deck and has the same size and programming limitations. Although the owners would be interested in a home in Salem, the purpose of the vessel is to provide sail training to disadvantaged youths. To meet its mandate the vessel would be sailing a great deal of the time and would not be available at dockside for interpretation.
>
> HMS *Rose* (reconstruction of a British man-of-war that originally dated from 1757): This vessel would make a strange match with Salem, since the city was the only major northern port not blockaded during the Revolution. The vessel owners have a significant debt they need to repay. The vessel is currently docked in Bridgeport, Connecticut. It could

> come to Salem from mid-July through October if the price was right. The owners could repay the Park Service some money if they were allowed to charge for tours.

Information has also been received about other vessels, some of which are currently for sale and some of which need extensive repairs. None of them appear to be appropriate.

Historical marine architects have indicated that the resources needed for accurate reconstruction are the original half-hull models and a period painting by a reputable painter that clearly shows the vessel and its rigging. Drawings were not typically produced for construction purposes. Shipwrights used scaled half-hull models, which they took apart to measure the angles and dimensions for a full-scale ship. The masts, spars, and rigging were usually of typical design and were not usually modeled. Extensive research indicates that sufficient data exist to accurately reconstruct a number of Salem ships. However, more information than usual exists for Salem's *Friendship*, including a scaled 9-foot model illustrating the complete exterior and interior design and rigging (built by the ship carpenter while aboard ship, making it extremely accurate) and also three period paintings done by well-known artists noted for their accurate depictions. In addition, information exists about the ship's voyages, including routes, cargo, and shipboard life. The *Friendship* was a 1797 square-rigged, 102-foot, three-masted ship built in Enos Briggs's shipyard, which was just opposite the historic site at the location where the Shetland Mills currently exist.

NATURAL ENVIRONMENT

Marine Environment

The southern edge of the park is dominated by Salem Harbor, a 900-acre coastal bay that is part of the larger coastal system known as Beverly-Salem Harbor, which in turn is part of Massachusetts Bay. Salem Harbor is shallow; the average depth of mean high water is 16.9 feet, and the average depth of mean low water is 9.5 feet. The harbor is relatively protected by outer islands and various peninsulas. Harbor waters are saline with little freshwater inflow from either of the two rivers flowing into it. The Forest River enters the harbor approximately 1.5 miles southwest of the park, and the South River, approximately 100 yards west of the park. The South River has been mostly filled in and developed, turning it into a brackish harbor channel that begins abruptly at a concrete seawall, with little to no freshwater inflow except for urban runoff from storm drains.

Salem Harbor is classified by the Massachusetts Department of Environmental Protection as a class SB water. Class SB waters are suitable for primary and secondary contact recreation, as habitat for fish, aquatic life, and wildlife, and for shellfishing with purification at a state facility.

Previous environmental studies and data collected for Salem Harbor have indicated water pollution problems. The harbor has been, and is still today, affected by a number of pollution sources typical of highly concentrated, industrial urban areas. The harbor is edged by a large coal- and oil-burning power plant owned by New England Power Company and a large sewage treatment plant run by the South Essex Sewerage District. The power plant receives weekly barge shipments of coal and oil and discharges a thermal plume from cooling effluent into the harbor. The sewage treatment plant was until 1977 regularly discharging untreated sewage into harbor waters. Since 1977 primary treatment has been installed, and secondary treatment facilities are planned in the near future (Camp, Dresser and McKee 1990). The plant services up to 41 million gallons per day. The U.S. Coast Guard Marine Safety Office in Boston has reported over 50 cases of oil/fuel spills near the park site during the last five years, at least seven of which amounted to 10-200 gallons.

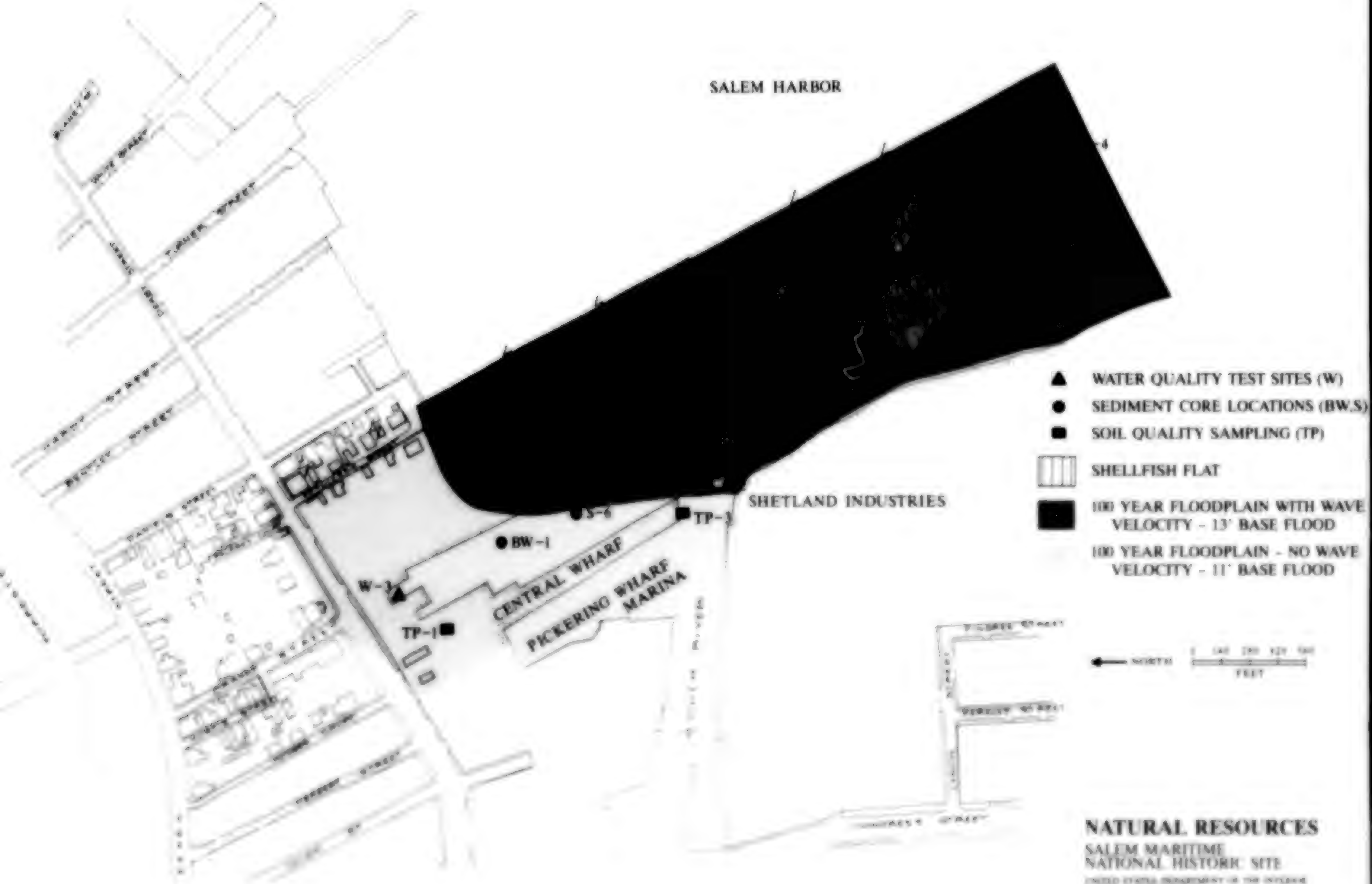
Water quality sampling at the park site was conducted during the summer of 1990 to assess harbor waters around the site and to provide updated information for assessing the impacts of possible dredging or wharf rehabilitation activities. This sampling indicated that harbor waters meet most class SB standards, with some deviations for values especially during wet weather conditions. During wet weather, pollutants such as fecal coliform bacteria increase as a result of increased runoff into the harbor. An outfall between Derby and Hatch's wharves is suspected to be a combined sewer overflow with higher than normal pollutants. The National Park Service will inform the Salem Board of Health regarding these findings. The sampling data are described in greater detail in appendix B.

A recent topographic and bathymetric survey accomplished for this site plan shows that the average water depth around the wharves at mean low water is only 2-3 feet, and mud flats are exposed at low water. The mean tidal range at the site is 9 feet. Previously dredged sections are deeper they include a channel between Central and Derby wharves that ranges from 6-11 feet deep at mean low water, a turnaround basin on the eastern tip of Derby Wharf that is 8 feet deep and the federal navigation channel leading into the South River/Pickering Wharf marina that was originally dredged 8-10 feet. The possible need for dredging in this shallow harbor raises concerns about decreasing the stability of the wharves and stirring up pollutants on the harbor bottom.

Sediment deposits around the park's wharves, which are mostly silt and sand deposits, could create instability if dredging occurred without proper engineering measures to protect the rock and timber walls of the wharves.

Past sediment data for Salem Harbor have indicated moderate to severe pollution potential. Army Corps of Engineers data gathered near the site at Pickering Wharf in 1979 indicated contamination by lead, chromium, vanadium, oil and grease, mercury, zinc, and nickel. The National Oceanic and Atmospheric Administration's National Status and Trends Program for Marine Environmental Quality sampled 212 sites throughout the United States, including Salem Harbor. Results, although only meant as indicators of problem areas and not a comprehensive study, showed Salem with 13 contaminants in the nation's top 20 list. Salem ranked the highest in the nation for chromium and also showed high levels of lead and cadmium (NOAA 1988).

Extensive tests of the site's harbor sediments were conducted during the summer of 1990 by Jason M. Cortell and Associates. These tests indicated that sediments on the site are contaminated with lead, chromium, and mercury and to a lesser extent arsenic and zinc. Other than at one [illegible] location adjacent to a western edge of Derby Wharf, where no dredging is proposed, the top 2 feet of the surface sediments are the only sediments found to have some

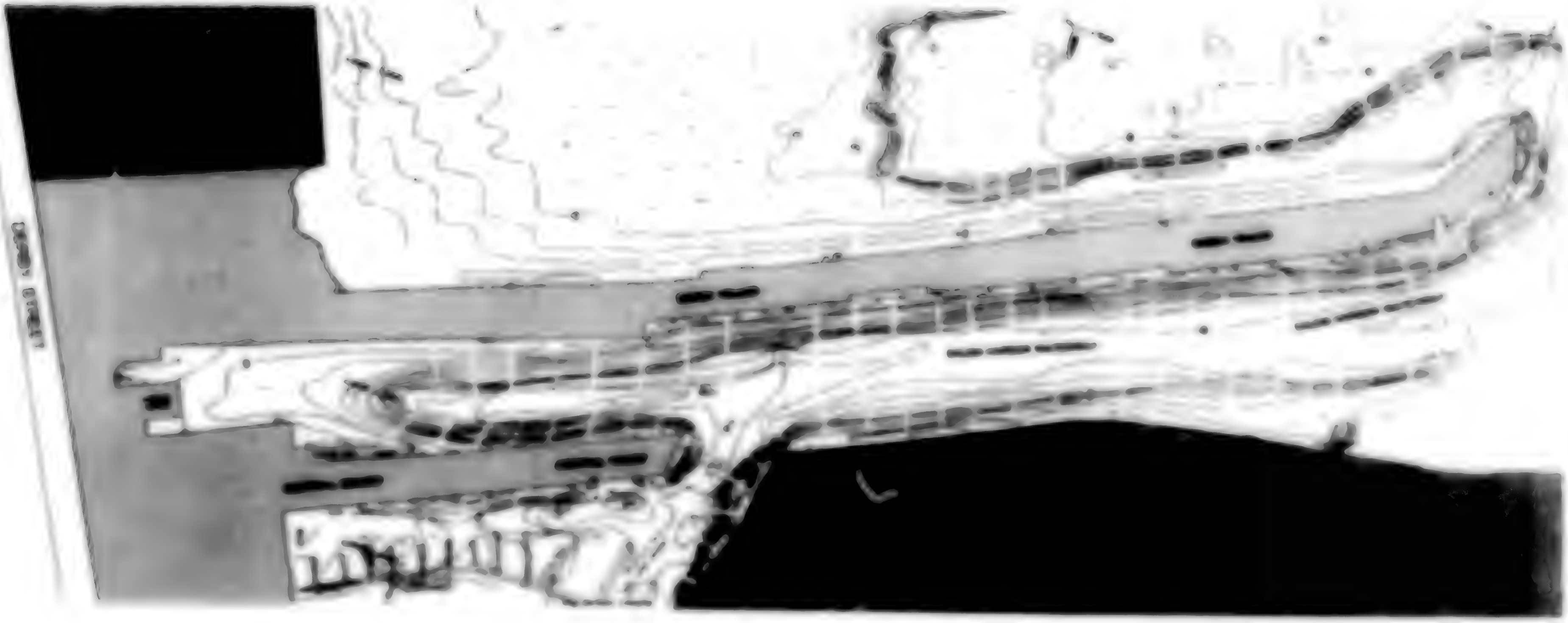

SALEM HARBOR
SHETLAND INDUSTRIES
CENTRAL WHARF
PICKERING WHARF MARINA
BW-1
S-6
W-3
TP-1
TP-3
▲ WATER QUALITY TEST SITES (W)
● SEDIMENT CORE LOCATIONS (BW,S)
■ SOIL QUALITY SAMPLING (TP)
▥ SHELLFISH FLAT
■ 100 YEAR FLOODPLAIN WITH WAVE VELOCITY - 13' BASE FLOOD
□ 100 YEAR FLOODPLAIN - NO WAVE VELOCITY - 11' BASE FLOOD
NORTH
FEET

NATURAL RESOURCES

SALEM MARITIME
NATIONAL HISTORIC SITE

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

BLANK PAGE



SITE BATHYMETRY

contamination. All deeper levels of material are uncontaminated and clean. The pollutant values indicated that the materials are not hazardous. No release of metals occurred during the elutriate analysis, which tests for the amount of materials released into the water during dredging operations.

To determine the suitability of the contaminated sediments for ocean disposal at the Massachusetts Bay Disposal Site, it was necessary to conduct a third tier of analyses under the EPA and U.S. Army Corps of Engineers testing protocols for dredging and ocean disposal. This included biological testing of three types of marine organisms representing different feeding strategies with the sediments to be dredged and reference sediments at the proposed disposal site. The bioassay tests showed a 40 percent difference in mortality of the amphipod species between dredged and reference sediments, but no significant mortalities in either the clam or worm species tested. The bioaccumulation results indicated high levels of bioaccumulation for cadmium, chromium, lead, and PAH compounds in the clam and worm species tested. There was no significant bioaccumulation of pesticides or PCBs in either species. A second bulk chemical analysis was also conducted to compare with earlier results. These tests showed similar elevated levels of chromium and lead in the upper sediment layers. The lower layers were again clean and uncontaminated as in the first bulk sediment tests.

The U.S. Fish and Wildlife Service's wetland inventory maps classify the waters of Salem Harbor, including those surrounding the park, as marine, subtidal, open water. On the northeastern edge of Derby from the sandy beach outward approximately 300 yards is a 2.7-acre tidal flat classified by the Service as marine, intertidal flat.

The Beverly-Salem Harbor is known as an important commercial fishing and lobstering area; within the park boundary, however, fishing is reportedly marginal. Over 80 percent of the fish population in the harbor is comprised of shore zone species, such as stickleback, silverside, striped killifish, and one bottom-dwelling species, winter flounder. Winter flounder is the most important sport fish species. Several other species, including smelt, alewife, and blueback herring, migrate through the harbor to spawn in freshwater. No known spawning habitat occurs in or adjacent to the park. Ichthyoplankton (fish plankton) studies of Salem harbor show most egg and larvae species are concentrated in the outer harbor areas in deeper waters. A 1979 state study of the harbor's ichthyoplankton conducted by the Massachusetts Department of Marine Fisheries found cunner, yellowtail flounder, fourbeard rockling, red hake, and windowpane to have the most common eggs found in the harbor. The several larvae species found included sand lance, cunner, and winter flounder.

Shellfish are known to exist in the intertidal flats near the wharves. Primary species inhabiting these coastal mud flats near or in the park include the soft shell clam and the blue mussel (MDMF 1987). The Massachusetts Department of Marine Fisheries recognizes the tidal flat on the northeastern edge of Derby Wharf as a "productive" shellfish flat that has contained 12 bushels of intermediate and 221 bushels of legal-sized clams. During benthic surveys conducted for this project, blue mussel beds were found from approximately mid-point of Derby Wharf to its end. The mussels were growing primarily on rocky substrates such as pebbles and cobbles, with only limited growth on seawalls and piles. Because of years of contamination, the shellfish beds of Beverly-Salem harbor have been closed to harvesting since the early 1930s. The Massachusetts Department of Marine Fisheries, however, is conducting sanitary surveys to reexamine the possibility of opening the beds to master diggers. Some lobstering occurs off the end of Derby and a lobster was found at station S-3 during benthic sampling.

Benthic surveying in the park's waters around the wharves found the bottom to be inhabited exclusively by pollution tolerant worms. A Shannon-Wiener diversity matrix showed values that are indicative of a shallow, polluted coastal estuary.

Algae species in harbor waters within the park include rockweed, irish moss, and sea lettuce. These species grow on the bottom and on rocks and piles on the site. No marine vascular plants are reported on site.

Terrestrial Environment/Floodplains and Wetlands

The park is located on a relatively flat low-lying site with a rocky intertidal shore. Approximate wharf elevations are 10 feet above mean low water for Derby, 13 for Central, and 8 for Hatch's.

General soil profiles on the site are predominantly fill material including clay, silt, fine to coarse sand, gravel, cobbles, cinders and ash, coal, brick, glass, ceramic, and wood. Derby, Central and Hatch's wharves are solid earthen structures filled over the years by dredge spoils and artificial fill from the adjacent harbor waters and off-site areas. The bedrock type at the site is gabbrodiorite. Underlying bedrock is well below the 13-foot sample cores that were done on the site.

The wharves are covered predominately with gravel, sand, sod, and salt-tolerant weed species. The park staff maintains the expansive sodded areas through weeding and mowing operations. The grounds around the historic buildings are landscaped with ornamental and native species common to the region. The area behind the Derby and Hawkes houses includes apple trees, roses, oaks, cherry trees, and various other ornamental trees and shrubs. The only other trees are a row of 24-inch-diameter beeches in concrete planters in the Central Wharf parking lot.

More than 72 bird species reportedly breed in the Salem Harbor area, and over 37 additional species are also found (U.S. Department of Energy 1982). The Peabody Museum staff reported in a personal communication that more than 16 species of ducks use the area, some of which have wintered there for more than 100 years. Ducks and shorebirds commonly seen include gulls, eiders, black ducks, greater scaups, old squaws, red breasted mergansers, golden eyes, black scoters, and buffleheads. Although rare, ospreys are occasionally spotted passing through the area.

The Federal Emergency Management Agency's flood insurance studies and maps were consulted to determine the 100-year floodplain, base flood elevations, and flood hazard areas. Much of the site south of the Custom House is within the 100-year floodplain (see the Natural Resources map). This includes Derby, Central, and Hatch's wharves, portions of Derby Street, and sod-covered areas landward of the wharves. The floodplain includes portions of the Central Wharf contact station and reaches the bottom steps of the Custom House. The historic buildings and northern yard areas between the Hawkes, Derby, and Narbonne houses are not within the 100-year floodplain. The maps indicate that Derby Wharf is also within a coastal high-hazard zone with wave action during floods calculated to be a minimum height of 3 feet. The flood hazard factor for this zone is 015, which means the difference in flood elevations between the 10- and 100-year floods is 1.4 feet. The base flood elevation for Derby Wharf is 13 feet NGVD (National Geodetic Vertical Datum of 1929) with wave velocity included. In the remainder of the floodplain outside this coastal high-hazard zone (Central and Hatch's wharves and the land areas seaward of Derby street up to the beginning of Derby Wharf) the base flood elevation is 11 feet NGVD.

U.S. Fish and Wildlife wetlands inventory maps and Massachusetts Division of Marine Fisheries information was consulted for wetland areas associated with the site. Except for the tidal flat on the northeastern edge of Derby, described in the "Marine Environment" section above, no other wetlands exist on or adjacent to the site.

Threatened and Endangered Species

Consultations with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and the Massachusetts Natural Heritage Program indicate no threatened or endangered, special status, or candidate species present in the project study area, except for occasional, transient endangered bald eagles (*Haliaeetus leucocephalus*) and peregrine falcons (*Falco peregrinus anatum*). No threatened or endangered plant species are documented.

Climate and Air Quality

Coastal winds and strong winter storms known as northeasters are important aspects of the marine environment that affect the park. Although its coastal location moderates temperature extremes between winter and summer, the park is in a zone of prevailing west-to-east atmospheric flow that brings both northward moving large air masses from the tropics and southward moving masses from the polar regions. The average annual temperature is 50.4 degrees F., but in the coldest months, January and February, temperatures average 29 degrees, and in the warmest month, July, they average 73 degrees. Average precipitation amounts to 42 inches. Low-pressure systems bring precipitation every one in three days from fall through spring. The prevailing winds are from the southwest, but the area is occasionally hit by powerful northeasters, which produce large amounts of wind, rain, and snow and cause most of the storm damage to park resources.

The nearest air quality monitoring stations are in Peabody and Marblehead. No air quality data exist for the park, but a soot problem was reported by the park staff in 1986 to the regional ecologist in Boston. The soot was suspected of coming from three sources: coal dust from the coal storage pile at the nearby power plant owned by New England Power Company, fly ash associated with incomplete combustion of coal, and coal deposits associated with incomplete combustion of oil (park files 1986). The New England Power Company plant, located less than a half mile from the park, has three coal- and one oil-burning generators. The state reports no occurrences exceeding the national ambient air quality standards within the metropolitan Boston area from 1983 through 1989 (even though the ozone standard is exceeded in most metropolitan areas throughout eastern Massachusetts). However, point source inventories and criteria pollutant data from the state files show that the Salem plant emits high levels of nitrogen oxides (NO_2) and sulfur dioxides (SO_2). From 1981 through 1987 the plant emitted an average of 43,000 tons per year of SO_2, and from 1980 to 1986 it emitted an average of 10,000 tons per year of NO_2. Coal and oil burning emissions are known to accelerate deterioration of wood, masonry, and other building fabrics.

SOCIOECONOMIC ENVIRONMENT

Visitor Use

Annual site visitation statistics are summarized in table 2. Visitor use peaks in July-August and is also high in October. Use is heavier on weekends than on weekdays, and heavier during the afternoons than during other times of day.

TABLE 2: ANNUAL SITE VISITATION, 1985-89

Year	Annual Visitation
1985	670,000
1986	674,000
1987	874,000
1988	743,000
1989	693,000

The 1990 *Salem Visitor Use Study* conducted for the National Park Service by Salem State College showed that 87 percent of visitors to Salem came for sightseeing/recreation. Visitors are attracted to the city primarily to see the witch sites and other sites related to early American history. Maritime history, architecture, and American literature sites are secondary attractions. Most visitors have little background knowledge of maritime history or the significance of the resources they will encounter during their stay. The most frequently visited locations in the city included the Salem Witch Museum (69%), Pickering Wharf (66%), the House of Seven Gables (65%), Essex Street Pedestrian Mall (61%), the Heritage Trail (45%), and Salem Maritime National Historic Site (42%).

Ninety percent of the city's visitors indicated that they arrived by automobile. Others come on regional bus tours. The highest percentage of visitors indicated that the Essex Street pedestrian mall was their first stop, followed by the Salem Witch Museum and Pickering Wharf. This indicates that visitors arrive first in the downtown area.

Transportation and Parking

On-Site Parking. As part of the site planning process, a parking and circulation analysis was completed by Bruce Campbell and Associates of Boston. The objectives of the study were to identify the existing demand for parking at Salem Maritime, locate and analyze potential off-site parking spaces, and analyze traffic and circulation patterns in the area.

Parking within the site boundaries includes 44 spaces in the Central Wharf parking lot and 32 spaces on Derby Street, including two parking spaces reserved for visitors with disabilities, for a total of 76 spaces. Parking surveys and analyses found that visitor use of the historic site exceeds the capacity of the

Central Wharf lot at peak times (see table 3), causing visitors to the historic site to compete with residents for parking along Derby Street. This contributes to a parking shortage in the immediate neighborhood surrounding the national historic site. However, the shortage is the cumulative effect of several factors, including the following:

Field surveys analyzing parking demand found that customers of adjacent Pickering Wharf use 62 percent of the national historic site's Central Wharf parking lot during weekdays and up to 81 percent on weekends (BCA 19[illegible]).

Residents of the surrounding high-density neighborhood park on Derby Street; however, since the street is not marked for resident-only parking like other neighborhood streets, national historic site staff and visitors, and employees and patrons of nearby businesses, also use the street for parking. Field surveys during the week showed that 90 percent of the cars parked along Derby Street were there all day, leaving few spaces available for visitors. On weekends the long-term parking decreases, but the overall parking demand remains high.

Local fishermen and boaters with vessels moored near the site use a few parking spaces, and one commuter was observed using the site as a park-and-ride location for leaving a vehicle all day.

Based on current visitor use statistics, the average peak-day demand for visitor parking in August was calculated as 64 spaces. This calculated demand, which would exceed the capacity of the Central Wharf parking lot by about 20 spaces, was field checked over a three-day period on a peak weekend in August. Observations verified that the demand for parking at the Central Wharf lot would exceed the lot's capacity by 10 to 20 vehicles between approximately noon and 5 p.m. on peak weekend days, as shown in table 3.

TABLE 3: HOURLY PEAK DAY TRAFFIC DEMAND (AUGUST WEEKEND DAY)

	FRIDAY		SATURDAY		SUNDAY	
TIME	DEMAND	% CAPACITY	DEMAND	% CAPACITY	DEMAND	% CAPACITY
8-9	9	21	15	34	4	9
9-10	9	21	9	21	20	46
10-11	17	39	23	52	19	43
11-12	38	86	29	66	25	57
12-1	61	139	33	75	51	116
1-2	48	109	51	116	65	148
2-3	54	123	62	141	64	146
3-4	44	100	65	148	70	159

Source: National Park Service and Bruce Campbell and Associates

The overall demand for parking in the lot regularly exceeds the supply because of the cumulative effects of other demand sources, such as shoppers, diners, and employees of nearby businesses.

The national historic site currently lacks designated curbside parking space for tour buses and the Salem Trolley to discharge passengers. As a result, buses double park in the traffic lanes. Between 25 and 328 buses per month come to the site between April and October, with October having the highest bus count. The Salem Trolley, which operates from April to October, pauses at the site once an hour during the summer as part of its city interpretive tour.

Off-Site Parking. The National Park Service is working with the city of Salem to solve transportation problems in the downtown. The *Salem Transportation Plan* (Bruce Campbell and Associates 1990a) recommended centralized downtown visitor parking and identified the East India Square garage as a suitable site for visitor parking. The garage has 1,025 spaces, and during peak use only 615 spaces (about 60 percent) are utilized; therefore, it could handle projected use by Salem Project visitors, including visitors to Salem Maritime National Historic Site, plus NPS employees.

The East India Square parking garage and Salem Project visitor center are less than a quarter-mile walk from the national historic site, through an area that would allow visitors to experience historic commercial and residential areas before reaching the park.

As suggested in the *Salem Transportation Plan*, the shuttle system could eventually link many of the historic resources in the city. An existing trolley operation currently links many tourist sites in Salem.

Derby Street. Speeding along Derby Street is a problem. Although the street is posted for 20 miles per hour, people were clocked driving up to 44 miles per hour during field investigations. This creates a hazardous situation for pedestrians crossing Derby Street between the northern and southern portions of the park. Derby Street narrows at the intersection of Orange Street and becomes one-way eastbound. Orange Street is one-way southbound, which prevents vehicles not wishing to continue on Derby Street from legally exiting the street at that intersection. Instead, many vehicles and large trucks and buses choose to make a hazardous U-turn at this intersection. In addition, vehicles often travel the one-way portion of Derby Street the wrong way. Additional traffic issues include the difficulty of motorists' seeing the off-street parking lot on Central Wharf because of a lack of signing and a blocked view of the entrance to the lot behind the contact station.

Tour Boat Service. A tour boat service currently operates out of Salem Willows. Related sites with water access that could potentially be served by a tour boat include Salem Willows, Winter Island, the House of Seven Gables, Salem Maritime, the South River, and Forest River Park/ Pioneer Village.

Salem's Economy and Tourism

Salem is a city of 38,000 residents, and its population has remained fairly stable with slight declines over the past 10 years. Unemployment within the city in recent years is estimated at 3 percent. Declines in retail trade and other industry over the past few years have placed Salem in a position of great change and adjustment. Figures for retail space show 180,000 square feet currently in use compared to 318,000 and 444,000 in 1987 and 1988 (Salem Partnership 1988).

Tourism is an important part of expanding and improving the local economy. Drawing on its abundance of historic resources and wide name recognition in connection with the witch trials, Salem attracts a broad range of visitors. Recent estimates are that over 600,000 visitors come to Salem each year. The 1990 *Salem Visitor Use Study* showed that Salem primarily attracts touring visitors who stay less than a day, do not stay overnight within 10 miles of Salem, and are heavily connected to Boston. Over half of these visitors (56%) come from the national market.

POSSIBLE MAINTENANCE SITES OUTSIDE THE BOUNDARY

The following is a brief overview of the sites currently under consideration for a maintenance facility. If any of these properties were selected for use, a proper resource base inventory for natural and cultural resources would be conducted prior to design and construction activities.

Property on Blaney Street East of the Historic Site

A piece of vacant property on Blaney Street approximately 1,500 feet east of the historic site is available for sale by a private owner and appears to be a suitable site for a maintenance and parking facility. This property, known as the Mackey property, is 2.3 acres according to city records. Much of the waterfront portion of the site could be left open for other uses and the remainder could accommodate a properly designed maintenance structure in conjunction with a 22-space parking lot to replace parking for local neighborhood residents.

The Blaney Street property is within the boundary of the Derby Waterfront National Historic District. Three structures on the property are listed on the National Register form and are therefore considered to be contributors to the district's significance. The historic and architectural significance of the structures would be documented if the National Park Service acquired the property. One of the three structures is associated with the Derby family and dates from the 18th century. Two of the structures have been badly damaged by fire and neglect.

Initial assessment of the Blaney Street property indicates a previously disturbed industrial parcel overgrown by weeds, shrubs, and a few deciduous trees. The site is within the 100-year coastal floodplain. The only wetlands on the site are intertidal flats (USFWS 1979). No other significant natural resources are known. The property is enclosed by the New England Power Company power plant tank farm on the east, the White Street Marina on the west, Salem Harbor on the south, and a few residential structures and a VFW hall and parking lot on the north.

The landowner, when contacted, was willing to pursue negotiations for the sale of the property.

Old East Branch Library on Essex Street

This abandoned building is located within a historic district and residential neighborhood approximately 200 feet from the park. The site could handle parking replacement and the required maintenance facility if the existing structure was removed.

The Essex Street property is within the Salem Common National Historic District. The library on the site was constructed in

1850 as the Bentley School and is listed in the National Register form for the historic district. On either side of the property lie the Sage-Webb-Wilkins house (52 Essex Street) and the Christopher Babbidge house (46 1/2 Essex Street). Across Forrester Street north of the property lies the Charles E. Fairchild house (9 Forrester Street). All three houses are contributing properties to the Salem Common National Historic District.

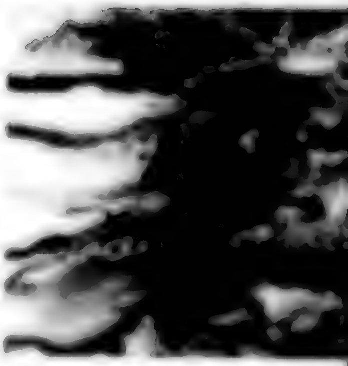
City-Owned Property at Fort Avenue and Prusak Square

Two empty lots owned by the city of Salem at Fort Avenue and Prusak Square could be used as a maintenance site. This property is more than one-half mile from the park and would be too far from the neighborhood to accommodate replacement parking. However, it might be possible for the National Park Service to develop a parking facility on the Blaney Street property and construct a maintenance site at Fort Avenue. This option would require extensive further study and has not been explored with the city of Salem.

Garage on Derby Street

A nearby garage at 285 Derby Street currently used for construction-related activities is available for lease. It appears that this facility would provide an adequate interim base of operations for maintenance activities.

PART FOUR: ENVIRONMENTAL IMPACTS



CULTURAL ENVIRONMENT

General

Remote sensing and archeological testing were conducted prior to this site plan so known resources could be avoided through sensitive design. Any ground disturbance at the site would be undertaken only after review by an NPS archeologist to determine the likelihood of cultural resources being present. Known resources would be avoided during construction. Construction activities would be monitored, if deemed necessary, by a professional archeologist, and findings would be documented. The integrity and significance of archeological features would be evaluated, and appropriate mitigative strategies would be worked out in consultation with the Massachusetts historic preservation officer.

Prior to this site plan the National Park Service also undertook a study of the site's history to help ensure that wharf rehabilitation and site improvements would not adversely affect cultural resources. Based on this study (Louis Berger and Associates 1990b) archeological testing and monitoring during construction would be especially important in the vicinity of the Forrester warehouse, at the head of Hatch's Wharf, at the base of the wharves, and in the area of the Central Wharf parking lot.

Alternative 1: No Action

Central Wharf. The "no-action" alternative presumes that ongoing actions to maintain park resources would continue. Central Wharf would be rehabilitated as programmed: The west side of the wharf, which is a steel bulkhead installed in the 1970s, would be modified to have the same appearance as the rest of the wharf. The east side and end of the wharf would be rehabilitated in a manner that would retain the existing form and present appearance. These changes would have no adverse effect on the wharf or on the site as a whole.

Because the commonwealth of Massachusetts no longer approves of the use of creosote in maritime construction, it would be necessary to treat construction timber with other chemicals, and it is likely that the new wood would be a green color until it sufficiently weathered to take on a more natural appearance.

A thorough archeological testing and evaluation program would be undertaken in conjunction with the wharf rehabilitation work to provide a clear understanding of how the wharf systems were constructed. Although major repairs would occur on mostly modern sections of the wharf, it is possible that portions of pre-20th century features might be uncovered and disturbed by rebuilding bulkheads and seawalls. Uncovering older sections would allow documentation of little-known construction methods and materials. Collection of this important information could aid future decisions about protecting and managing the wharves and add to the scientific data base.

Rehabilitation would be followed by periodic maintenance to avoid deterioration due to weather, public use, and high tides. (Unless the park maintenance staff was enlarged and sufficiently trained to handle the periodic maintenance required, after large storms or high tides the wharf's stability would once again be threatened.)

The warehouse/visitor contact station and Forrester warehouse foundation would be maintained in their present conditions with no effect on cultural resources of the site.

Hatch's Wharf. Hatch's Wharf would remain in its present condition with minor repairs to stonework undertaken as required to preserve the present appearance. This would result in no effect on the significance of Hatch's Wharf or the historic site.

Derby Wharf. Derby Wharf would remain in its present condition with minor repairs to the surface and stonework undertaken as required to preserve the present appearance. As fill leached out between the stones, it would be replaced. As stonework was displaced, it would be reset.

Derby Beach. The beach would remain in its present condition, partially grassed and partially sand. This would result in no effect on the cultural resources of the site.

Derby Street. Derby Street would continue to be maintained by the city. Cars parked along Derby Street would continue to pose a significant barrier to site cohesiveness. However, this would not result in any new impacts. The National Park Service would continue to work with the city and the power company to eventually underground the power lines along Derby Street. An archeologist would monitor construction to protect and record significant cultural resources.

North Area. The north area would continue to be maintained in its present condition, with no impact on the site's cultural resources.

Off-Site Properties. There would be no effect on cultural resources outside the national historic site boundary.

Alternative 2: Three-Dimensional Interpretive Form

Central Wharf. The impacts of rehabilitating Central Wharf would be similar to those described for alternative 1. In this alternative, however, the wharf would be rehabilitated in a manner that would allow dredging to occur without weakening the wharf structure. Dredging would have the potential to disturb underwater archeological sites. To minimize this potential, a thorough history of dredging around Central and Derby wharves was conducted, and remote sensing was used to identify any large anomalies present in the water. NPS underwater archeologists would use this data to scientifically retrieve any cultural resources that might otherwise be lost as a result of dredging or construction activities.

If a new restroom and shower facility could be sensitively added onto the warehouse (which is now used as a contact station) at the head of Central Wharf that action would have no adverse effect on the existing structure. Although the structure is a historic warehouse building, it does not sit on its historic site, does not represent a similar building that sat on its present site, does not occupy a location that approximates the location of such a structure on a wharf, and serves only as an example of a warehouse of the early 19th century.

If it was not possible to sensitively add onto the existing building, the nearby construction of a new restroom and shower facility would have no effect on the warehouse/contact station because that structure's significance depends on the architectural appearance of the building and not on its setting. A new structure on the site would introduce a nonhistoric element onto Central Wharf. Because the new structure would not detract significantly from the appearance of Central Wharf as seen from elsewhere in the national historic site, the effect would not be adverse.

The effect of removing the existing parking lot and landscaping the area would not be adverse because no new impact would occur outside the already disturbed area and because overall development would be designed to be less noticeable from elsewhere on the national historic site. Ghosting the Forrester warehouse would be accomplished in a manner that would have no adverse effect on the historic remains. The ghosted structure would not block visitors' views of Central Wharf. The overall effect on the site would not be adverse.

Ghosting the Forrester warehouse, paving the staging area, building walkways, and placing waysides and other interpretive media on the wharf would have a minimal effect on archeological resources. Secondary impacts from increased visitor use would not be expected to have any effect on archeological resources.

Hatch's Wharf. The wharf would not be noticeably changed from its present appearance. Hard surfacing of a small portion of the wharf would not be an adverse effect because the new surface could be removed at any time and the present appearance could be recovered (although the present grassy appearance is not the historic appearance of the wharf, either). Minor stone repair and measures to halt unnecessary loss of fill material would be designed to have as little effect on the wharf's appearance and historic fabric as possible. Because of previous disturbance and fill activities, no significant archeological resources would be expected in the uppermost soil levels, and deeply buried archeological resources would be protected by the new surface.

Derby Wharf. Minor stone repair and measures to halt unnecessary loss of fill material would be designed to have as little effect on the wharf's appearance as possible. Installation of a steel bulkhead along the wharf in the area where the ship would be docked would allow dredging to occur without weakening the wharf structure. The bulkhead would be below mean low water, where it would not be visible, and it would have no adverse effect on the structure.

Some modification of the wharf in this area would presumably be necessary to allow access to the ship for people with physical disabilities. This would be done as sensitively as possible, and all work would be thoroughly documented so that changes could be fully reversed in the future should that be deemed necessary. It appears that older sections of the wharf are deeply encapsulated beneath and within newer segments, and the wharf modification would not adversely affect significant archeological resources. Installation of the steel bulkhead would disturb only a very narrow band of marine sediments, so the likelihood of impacting important archeological remains on the harbor bottom would be small.

The new interpretive buildings would be constructed on nondisplacement piles to minimize effects on the wharf. Previous reconstruction of Derby Wharf is thought to have destroyed any evidence of the original structures occupying its surface, so this action would have no effect on subsurface archeological evidence. Any undisturbed historic sections of the wharf that might be extant would be deeply buried and would not be affected by this project.

Construction of one or two new buildings with the dimensions characteristic of the warehouses of the period would have a visual effect on the wharf and the site. These would be new structures with modern features and materials and not reconstructions because adequate data do not exist to accurately reconstruct a warehouse. Modern buildings which utilize modern materials and building techniques but which utilize the basic mass and scale of a historic building are acceptable as long as it is clear that the structures are modern and do not confuse visitors into thinking they are looking at historic buildings. Because the structures would be approximately the same size as structures that were historically on the wharf, they would not unduly block views from the historic houses across Derby Street, and they would appear to be warehouses on first glance. Should it be necessary to remove the new structures, the present appearance of the wharf could be restored with no adverse effect.

Ghosting several additional warehouse structures would not block views of the harbor from the street.

The ship would not have an adverse effect because it could be moved from the site without irreversibly affecting the appearance of Derby Wharf. The bulkhead designed to protect the wharf could be left in place without visually affecting the site.

Removal of the modern, deteriorating piers from the east side of Derby Wharf would be accomplished in a manner that would not affect any underwater archeological resources.

Derby Beach. Construction of a small modern building to provide storage and work space for the dory-building exhibit near the beach would not adversely affect the wharf or the national historic site. The building would not be located on a historic building site and would not represent a historic structure. Should dory building be discontinued in the future, the structure could be removed and the site returned to its present appearance. Because of its location along the park boundary, the structure should not adversely affect views of the wharves or the historic structures across Derby Street. Because construction activities would be shallow and concentrated in an area of modern fill, no archeological resources would be affected in the beach area. Remote sensing and archeological testing have located two deeply buried features, both of which would be avoided during construction.

Derby Street. Providing a historic surface on the portion of Derby Street inside the site boundary would slow down traffic and recapture a more historic appearance than at present. Undergrounding of power lines and removal of parking during the daytime would be aesthetic improvements, as visitors looking either north from the wharves or south from the historic structures would have a view unobstructed by power poles and parked cars.

Ground disturbance could uncover sections of earlier thoroughfares or cesspools used for refuse, which were reportedly located on Derby Street near the wharves. Uncovering some of these encapsulated remains would create the potential for damaging archeological resources; however, it might also allow documentation of the street's exact location, width, construction methods, materials, and artifacts, and help verify scanty and contradictory historic descriptions.

The overall effects on the cultural resources of the site, either direct or indirect, would not be adverse.

North Area. This alternative would not directly affect any of the historic structures or archeological remains in the north area. The grounds would not be restored to their historic appearance because there is not at present enough archeological and historic data to allow such a restoration. The grounds behind the Custom House would contain exhibits of items found in the yard during the historic period. The other grounds would remain as at present, a parklike green space. The effect of this approach would not be adverse.

Off-Site Properties. The three National Register structures on the Blaney Street property would be thoroughly researched prior to any development on the site. The site is sufficiently large that they would not have to be removed to meet the needs for which the National Park Service would buy the property. Archeological investigations would be conducted prior to site development to identify and evaluate the significance of any archeological resources. Archeological findings would help guide site development so important resources could be avoided and protected.

Should the National Park Service choose to develop the Essex Street property for a maintenance facility and public parking, substantial modifications to the site would be required. It is questionable whether the library structure could be altered to meet the maintenance needs of the park. If not, the library would have to be removed and a new facility constructed. Removal of the library building would be an adverse effect under the Advisory Council on Historic Preservation's "Criteria of Effect" in the "Regulations for the Protection of Historic and Cultural Properties" (*Code of Federal Regulations*, title 36, part 800). This action would also have an adverse effect on the surrounding three National Register properties and on the Salem Common National Historic District because it would change the residential character and use of the site.

The Fort Avenue site is not within a National Register district.

Summary. No adverse effects would be associated with activities inside the historic site boundary. If the Blaney Street property was used for the maintenance facility, the development described for alternative 2 would not have an adverse effect under the Advisory Council's criteria of effect because that site is large enough to provide adequate landscaping to mitigate visual impacts. If the Essex Street property was used for the maintenance facility, this alternative would have the adverse effects of removing one historic building and changing the residential character of the setting of three additional historic buildings. Any ground disturbance proposed would be evaluated by an NPS archeologist to determine the need for monitoring or testing.

Alternative 3: Low-Profile Interpretive Media

Central Wharf. Because there would be virtually no change in the appearance of the wharf from the present, the effect of rehabilitating the wharf would not be adverse. Because there would be no dredging in this alternative, underwater archeological resources would not be disturbed.

Removal of the parking lot and relandscaping the site for modern park uses would replace one modern use for another and would not be adverse.

Hatch's Wharf. Impacts would be the same as described for alternative 2.

Derby Wharf. Minor stone repair and measures to halt unnecessary loss of fill material would be designed to have as little effect on the wharf's appearance as possible.

Removal of the modern, unused, deteriorating piers on the east side of Derby Wharf would be accomplished in a manner that would not affect any underwater archeological resources.

Installation of large waysides on the wharf would not adversely affect historic fabric or archeological remains. No evidence of structures on the wharf has survived, and any historic wharf fabric is deeply buried, so the potential for effect on archeological resources would be minimal.

Derby Beach. The installation of waysides in the area between Derby Street and the beach would have no effect on cultural resources.

Derby Street. Derby Street would not be returned to a more historic appearance, and parked cars would continue to intrude on the scene. Undergrounding of power lines would be an aesthetic improvement.

North Area. Impacts would be the same as described for alternative 2.

Off-Site Properties. Impacts would be the same as described for alternative 2.

Summary. Alternative three would involve the least development of all the action alternatives and, therefore, would have the least developmental impacts. The overall impact would be minor and would not be adverse under the Advisory Council's criteria of effect. Any ground disturbance proposed would be evaluated by an NPS archeologist to determine the need for monitoring or testing.

Alternative 4: Museum/Recreational Use

Central Wharf. Impacts would be the same as described for alternative 2 with one exception: The existing inappropriate visual impact caused by automobile parking on the wharf would continue.

Hatch's Wharf. Impacts would be the same as described for alternative [illegible]

Derby Wharf. Upgrading of the nonhistoric docks and construction of new docks to allow tour boats, sailboats, and dories to dock at Derby Wharf would not affect the structural stability of the wharf. Some modification of the wharf might be necessary to make it accessible to people with physical disabilities who were entering the site from the docks. Because the docks would be separate structures only minimally attached to Derby Wharf for access purposes, and because they could be removed at any time, the effect on the wharf would not be adverse. The docks would stick out about 25-35 feet from the wharf and could present a visual intrusion on Derby Wharf.

The new visitor contact/museum structure would be constructed on non-displacement piles on the wharf and on piles in the water east of Derby Wharf and would, therefore, have minimal impact on the wharf or any archeological remains. The building would be an obviously modern structure and would make no attempt to look historic so as not to confuse visitors; however, because each structural unit would be the approximate size and mass of those historically on the wharf, the building would have obvious interpretive uses.

This contact/museum facility would be larger in its entirety than any structure that existed on Derby Wharf during the period of Salem's maritime greatness. From the front and from many areas of the national historic site this facility would present a large physical barrier to the views of the harbor, being larger than the structure or structures called for in alternative 2. This alternative would have an adverse effect on the historic scene of Derby Wharf as seen from other viewpoints in the park, even though its direct effect on Derby Wharf would be minimal.

Derby Beach. Impacts would be the same as described for alternative 2.

Derby Street. Impacts would be the same as described for alternative 2.

North Area. Impacts would be the same as described for alternative 2.

Off-Site Properties. Impacts would be the same as described for alternative 2.

Summary. The development described in alternative 4 would be an adverse visual effect upon the resources of Salem Maritime. The visitor contact/museum facility would be a large modern structure, larger in scale than any structure that ever existed on Derby Wharf, and it would act as a barrier to ocean views from the historic structures along the north side of Derby Street. It would also cause visitors to focus their attention on a modern structure rather than on Derby Wharf. Because use of the wharf would require docks extending about 25-35 feet out from the wharf, the visual impact on the site's appearance would be negative.

NATURAL ENVIRONMENT

Alternative 1: No Action

Marine Environment. The harbor area adjacent to the wharves would be left alone and would continue to be a shallow waterway. No dredging would occur.

Wharf construction activities would be limited to rehabilitation of Central, Derby, and Hatch's wharves. Disturbance would be limited to replacement of some of the bulkhead, primarily on Central Wharf, and to repair of the existing granite walls on Derby and Hatch's wharves. Siltation would be minimized by temporarily storing wharf fill material in sealed barges or containers on site, then replacing it on the wharves wherever possible. Unused wharf fill and other waste materials would be disposed in an approved landfill. The pulling and replacement of piles to rehabilitate the timber bulkheads on Central Wharf would cause minor short-term impacts on harbor water quality. Silt curtains would be used to reduce the amount of fugitive sediments released, thus minimizing turbidity. Minimal equipment would be needed to repair the granite block walls on Derby and Hatch's wharves. The grout material used to repair those walls should be encased in a biodegradable mesh that would not entangle marine wildlife as it disintegrated. Overall, there would be little disturbance to surrounding waters, and no fisheries, shellfish beds, or benthic organisms would be significantly affected.

Terrestrial Environment. There would be no impact on floodplains, wetlands, or other components of the terrestrial environment. All landward soil and waste materials from wharf rehabilitation work would be disposed of according to Massachusetts solid waste disposal regulations at an approved site. Wharf rehabilitation would not affect freshwater wetlands and would enhance the stability of the wharves to withstand periodic coastal flooding and the 100-year flood event. A statement of findings would be required for construction work within the 100-year floodplain, which includes Derby, Central, and Hatch's wharves.

Threatened and Endangered Species. There would be no impacts on federal or state listed threatened or endangered, candidate, or special status species. Further consultation for endangered species at the site would occur during schematic design and construction.

Air Quality. Increased vehicle trips by construction equipment would cause minor short-term air quality degradation in and around the site. Pollution from automobile traffic and other sources in and around the site buildings and nearby homes would continue.

Alternative 2: Three-Dimensional Interpretive Form

Marine Environment. This alternative would disturb 17,600 cubic yards of harbor sediments between Derby and Central wharves to create a slip 13 deep at mean low water. Contaminated sediments would amount to 7,600 cubic yards of the total 17,600 cubic yards of dredged material. Dredging would be conducted by clamshell or bucket excavation onto sealed barges. Hydraulic dredging would not be used. Silt curtains would be deployed during operations to reduce turbidity. Short-term impacts on harbor water quality during dredging operations and the pulling and replacement of piles for the timber bulkheads would include increased turbidity, decreased dissolved oxygen levels due to sediment released into the water, and exposure of marine organisms to sediment pollutants. Exposure to pollutants would be expected to be minimal because the elutriate analysis showed that no metals would be released into harbor waters during dredging or replacement of timber piles and sheet piles. Localized algal blooming might temporarily increase during dredging as nutrients and organics in harbor sediments were stirred up and mixed into the waters around the wharves. The large tidal range, 9 feet, at the site would allow for flushing and mixing of the waters and prevent long-term adverse impacts from biochemical oxygen demand or long-term algal blooming (which would otherwise further decrease dissolved oxygen levels). The short-term, localized impacts on water quality resulting from this action would not contribute to any cumulative impacts on Salem Harbor water quality.

Other potential sources of siltation would be minimized. Wharf fill material removed during installation of utilities and excavation for replacement of deadmen, tie rods, and other elements would be retained in sealed barges or containers on site to prevent it from silting into harbor waters. Excavation work on the wharves would be phased, and disturbed fill material would be replaced or disposed of as work progressed to prevent it from accumulating on the site.

Benthic organisms would not be significantly affected. The harbor bottom between the wharves in the dredged area would be permanently deepened with new subsurface slopes of 1:5. The upper 2 feet of contaminated sediments would be permanently removed from the site, exposing cleaner bottom sediments between the wharves and locally improving sediment quality around the wharves. Sessile benthic organisms displaced from dredging would be expected to repopulate the area. The composition of the harbor sediments would not be significantly altered, as grain sizes at the project depth are similar to those on the current surface.

There would be no significant impacts on fin fisheries in the area to be dredged. No documented spawning habitat or migratory routes would be affected. Ichthyoplankton studies of Salem harbor show most egg and larvae species are concentrated in the outer harbor areas in deeper waters. The limited potential for impacts on ichthyoplankton species near the wharves would be further mitigated by respecting the statewide moratorium during fish spawning and migration periods and scheduling dredging and wharf rehabilitation activities during the fall or winter when eggs and larvae would be at their lowest levels. Dissolved oxygen levels would also tend to be higher during the winter months; thus, the buffering capacity of harbor waters would be higher.

Shellfish beds would not be adversely affected. The nearest shellfish flat with significant populations of soft-shelled clams is on the other side of Derby Wharf from where dredging or wharf rehabilitation would occur, and the wharf would act as a barrier to the spread of turbidity into this area. Lobsters would not be affected. Only a few blue mussels and other intertidal organisms were found inhabiting the rocks and piles along the approximately 300 linear feet on the western edge of Derby Wharf that would be disturbed by dredging and sheet pile placement. Some piles might be driven into the intertidal flats adjacent to the east side of Derby Wharf to help support the new interpretive building or buildings on Derby Wharf, but they would not adversely affect the shellfish beds on the eastern edge of Derby. Most intertidal areas around Derby Wharf would not be disturbed during construction or dredging. None of the intertidal flats surrounding Hatch's Wharf would be affected. Prior to dredging and construction around the wharves, blue mussels and lobsters found in the intertidal area along the wharf could be collected and moved to another location along the wharf that would remain undisturbed.

Disposal of the 17,600 cubic yards of dredged material spoil would be handled according to all pertinent permits and approvals and would include extensive physical, chemical, and bioassay testing of the material to be disposed of. The disposal alternatives include open-ocean disposal of the entire 17,600 cubic yards at the Massachusetts Bay Foul Site, which is an approved and monitored offshore disposal site, land disposal of the entire amount, or a combination of ocean and land disposal. Any ocean disposal would conform to all procedures required by the Massachusetts Department of Environmental Protection, the U.S. Environmental Protection Agency, and the U.S. Army Corps of Engineers and would be contingent on the contaminated portions of the material passing the bioassay/toxicity testing. One option for ocean disposal would be to cap the contaminated sediments at the disposal site by placing the 10,000 cubic yards of cleaner material on top of the 7,600 cubic yards of contaminated material. The Army Corps of Engineers and state water pollution control permitting processes would allow ocean disposal only if it would not result in any significant or adverse effects on marine waters.

Results of the bioassay and bioaccumulation studies indicated that the contaminated portions of the dredged sediments passed some of the ocean dumping criteria but exceeded the mortality for the amphipod species tested. Bioaccumulation of metals in two test species showed elevated levels of some metals such as chromium and lead. The National Park Service would consult with the U.S. Army

Corps of Engineers to assess the biological testing results. In compliance with the strict permitting and regulation at both the state and federal levels, the National Park Service would pursue appropriate disposal options for the contaminated portions of the sediments, such as disposal at an EPA approved land disposal site, capping in ocean waters, or other options that would not cause significant long-term or cumulative adverse effects. Disposal of the cleaner sediments in open ocean waters at the Massachusetts Bay Disposal Site would not have any long-term or cumulative adverse effects.

Terrestrial Environment. All construction within the 100-year floodplain would be floodproofed, and wherever possible it would be raised above the base flood elevation (the maximum predicted height of a 100-year flood). No significant or adverse impacts would result from placing interpretive structures in the floodplain on Derby Wharf. Elements such as tie-downs, open floors, and drainage systems would be incorporated into building designs to reduce buoyancy factors and help protect property during periodic storm floods. Hardened surfaces would not significantly alter drainage patterns or change flood elevations on the site. The interpretive warehouses, ghosted structures, and ship could not practically be constructed outside the floodplain because they are directly tied to the wharves, which are inside the floodplain. If a finding of no significant impact is prepared for this project, a statement of findings will be prepared to outline compliance with the NPS guidelines for implementing Executive Order 11988, "Protection of Floodplains."

Construction of a maintenance facility inside the floodplain on the Blaney Street site would require the structure to be raised above base flood elevations according to NPS guidelines for implementing Executive Order 11988. The small parking lot would be exempt under the NPS guidelines for excepted actions. Hazardous materials, such as mower gasoline, solvents, and paint, would not be stored within the floodplain areas. The Fort Avenue site is within the 500-year floodplain, but not the 100-year floodplain. Further study of these options would be required if they became the preferred options.

No significant wetland areas would be altered.

Some landward soil and grass would be permanently disturbed and compacted to build the shipbuilding exhibit on the open space area across from the Derby house.

All landward soils and waste material would be disposed of according to Massachusetts solid waste disposal regulations at an approved disposal site. Land disposal would be required for any landward soil removed permanently from the wharves, old timbers, and any other landward wastes. In addition, dredged material might require land disposal at properly designed sites. Land disposal of dredged sediments would be more expensive and logistically complicated than ocean disposal, but it would be required if the sediments did not pass the bioassay/toxicity standards required for ocean disposal. To dispose of 17,600 cubic yards of sediments on land, a total of 1,500 to 1,800 two-way truck trips would be required during the dredging phase of this project. If only 7,600 cubic yards of contaminated sediments required land disposal and the rest of the clean material was taken to the ocean disposal site, 625 to 700 two-way truck trips would be required.

Air Quality. No significant impacts on air quality would occur. A minor, temporary localized decrease in air quality might result from emissions and dust produced by construction equipment and activities. Removing visitor parking from the site would decrease the amount of fumes and vehicle exhausts entering the historic site buildings and nearby residences.

Alternative 3: Low-Profile Interpretive Media

Marine Environment. Construction impacts on the wharves would be limited to the disturbance of fill material on Derby Wharf for the installation of waysides. Pulling and replacement of piles during wharf rehabilitation would cause minor short-term impacts on water quality. Increased turbidity would be minimal. No dredging would occur. No sediment or fill material would need disposal or would impact harbor waters. Consequently, no impacts on fisheries, shellfish beds, or benthic organisms would occur.

Terrestrial Environment. Impacts on the floodplain inside the existing site boundary would be minimal. Development in the floodplain would include only wayside exhibits, which would be floodproofed and designed to handle the seasonal and 100-year coastal flood storms. A statement of findings would be required.

Impacts on the floodplain at a maintenance site on either Blaney Street or Fort Avenue would be the same as described for alternative 2.

No significant wetland areas would be altered.

All landward soils and waste material would be disposed of according to Massachusetts solid waste disposal regulations at an approved disposal site.

No dredging would occur; therefore, there would be no potential for impacts associated with land disposal of contaminated sediments.

Air Quality. Impacts would be the same as described for alternative 2.

Alternative 4: Museum/Recreational Use

Marine Environment. Impacts on water quality and benthic organisms would be similar to alternative 2, differing as follows.

The amount of dredging and associated disturbance would be reduced by approximately one-third.

Construction of floating docks for day-use boat docking on the southwest side of Derby Wharf would require placement of piles into an area of intertidal flats that showed the highest lead contamination levels of the entire site. Consequently, disturbance of marine sediments in this area would have to be avoided by preventing dredging piles and other construction activities from disturbing sediments in this area. Floating docks with suitable anchorage would be designed so that no additional effects over those described for alternative 2 would occur.

Impacts on fisheries would include all the impacts described for alternative 2, plus the following: The rocks and substrate off the southwest section of Derby Wharf, where floating docking facilities would be constructed, are larger than those to the north and support a higher concentration of intertidal mussel beds. More of these shellfish would be displaced, but no significant populations would be affected by dock construction. The shellfish flat and intertidal area on the east side of Derby Wharf would be affected by the additional piles and decking required to place the large museum facility on the wharf. Some shellfish would be permanently displaced from this area, but the impact would not be significant. Also, the 2.7-acre shellfish flat off Derby Beach would be minimally affected during construction of the shipbuilding exhibit, which would be located closer to the water and mud flat under alternative 4 than it would be under alternative 2. Mitigation to reduce siltation of landward soil into the harbor at this point would be initiated, and no significant impact would occur.

Terrestrial Environment. The museum facility and deck exhibit would be constructed in the 100-year floodplain and would require a statement of findings. The building would be floodproofed and raised above the base flood level. Floodproofing and stabilizing a structure of this size would be technically complex and expensive.

Impacts on the floodplain at the maintenance site would be the same as described for alternative 2.

No significant wetland areas would be altered.

Some landward soil and grass would be permanently disturbed and compacted to build the shipbuilding exhibit.

All landward soils and waste material, and dredge material if necessary, would be disposed of according to Massachusetts solid waste disposal regulations at an approved disposal site, as described for alternative 2.

Air Quality. Impacts would be the same as described for alternative one.

SOCIOECONOMIC ENVIRONMENT

Alternative 1: No Action

Impacts on Visitors. The site would continue to attract the current level of visitor use. Visitors would continue to have a frustrating and limited park experience. They would continue to have trouble reaching the park, finding available parking, and understanding the nationally significant maritime history of the site. Many would not even know they had been to a national historic site and would miss much of the unique history of the park.

Cars parked on Derby Street inside the historic site boundaries would intrude on visitors' views of the waterfront, making it more difficult to visually connect the two parts of the site, and they would pose a safety hazard for pedestrians crossing the street.

Impacts on Residents and the Local Economy. Salem's economy and visitor use patterns would remain unaffected.

Residents could continue to park on Derby Street and in the Central Wharf parking lot; however, park visitors would continue to compete for these spaces with residents and commercial establishments, and neighborhood parking shortages would continue.

Alternative 2: Three-Dimensional Interpretive Form

Impacts on Visitors. The plan would help visitors experience the site in a logical sequence, beginning with an overview of how the site fits into the historical context of the Salem Project themes.

The removal of the parking lot from the historic site would enhance the visitor experience by providing space for a picnic area and removing unsightly distractions from the historic scene. Park management would also benefit from this action by reorienting the staff required to manage the parking problems generated at the Central Wharf lot. The replacement of visitor parking with an adequate number of parking spaces in the East India Square garage, near the Salem Project visitor center in downtown Salem, would ensure that visitors to the national historic site would not have to compete with other users and could find adequate parking. Adequate capacity exists in the garage to accommodate growing demand and to allow visitors to leave their cars there for as long as it would take them to tour the city's resources. This system would be tested for an interim trial period to ensure that it adequately served visitors before the Central Wharf lot was actually removed.

On the one hand, the provision of centralized parking and low-cost shuttle service would allow visitors to leave their cars or buses behind shortly after entering the city and minimize the frustration some visitors would experience with having to deal with city traffic and parking problems. On the other hand, some visitors would feel inconvenienced by having to leave the comfort of their private vehicles or tour buses to travel to the historic site. Visitors with disabilities would still be able to park on Derby Street near the contact station.

Site design elements, such as historic-appearing pavement along Derby Street inside the boundary, would help visitors understand where the historic site begins and ends, better represent the historic character of the street, and help connect the north and south sides of the park. Resurfacing Derby Street would also reduce speeding within park boundaries, and this coupled with on-street parking restrictions would make it safer for visitors to cross the street.

The provision of tour boat service would give visitors the opportunity to reach the site by water, which would heighten their maritime experience and orient them appropriately to the historic site.

The interpretive program would provide a lively, active, and participatory atmosphere on the wharves and a strong linkage between the north area and the wharves. Interpretive media with three-dimensional form would allow visitors to utilize all of their senses and feel the density, scale, enclosure, and overall ambiance of the wharf environment. Visitors would gain a strong sense of how the warehouses, wharves, and vessels functioned, the kinds of cargo that were shipped and stored, and how the cargo was handled aboard ship and on land.

The vessels and wharves would act as a visitor magnet. The site would be expected to attract more national visitors, and the rotation and changing of visiting vessels would encourage repeat visits by regional and local residents.

The interpretive programs, pathway design, and historic surfacing of Derby Street would help visitors understand the strong linkages between the north area, Derby Street, and the wharves.

A mix of active programmed interpretive areas and open space would make it possible for visitors to be involved in the lively harbor experience and to relax and contemplate the history of the site in peaceful settings.

The major exhibits would be in winterized, year-round facilities. The ghosted structures would provide expanded summer and special event space in surroundings designed to withstand the winds and inclement weather conditions of the site. Waysides and three-dimensional forms would let visitors interpret the site when the indoor facilities were closed.

Even though some of the open space would be removed, ample space would remain for spontaneous play and special programs. Derby Wharf would still be used as a national recreation trail, and additional facilities would allow for day-use boat docking.

The new rest and picnic area on Central Wharf would create opportunities for visitors to view the park's harbor scene while relaxing and eating.

Impacts on Residents and the Local Economy. No on-street parking spaces would be removed until alternative parking spaces were provided. The south side of Derby Street would be signed for no parking only from 8 a.m. until 5 p.m.; any other time people would be allowed to park in this area. By replacing removed daytime parking spaces yet allowing nighttime use of both the proposed new parking lot and the on-street spaces, twice the number of parking spaces would be available in the evenings, which is when the most acute shortage exists in the area. The new lot would be within a half mile of the historic site and within the adjacent neighborhood. Residents and patrons of neighborhood establishments would be inconvenienced by having to walk farther from the new parking lot.

The elimination of visitor parking at the historic site would reduce the amount of traffic in the adjacent neighborhood. Impacts from increased visitation would be better absorbed into the downtown areas, reducing the impact on the neighborhood around the site. It would also alleviate the problem of visitors' expecting but not finding adequate parking at the national historic site and displacing neighborhood residents from on-street parking spaces outside the site boundary. Making it possible for visitors to access the historic site by tour boat and private boat would help bring tourists into the area without additional impacts from cars.

Smoother and safer traffic flow would be achieved within the area of the park by changing Derby Street to one-way going east from Hodges Court and changing Orange Street to one-way going north (rather than south as it currently does).

If all the material dredged from the harbor to accommodate the proposed development required land disposal, this activity would involve up to 1,800 two-way truck trips between the wharves and a land disposal site. This is a worst case projection. The National Park Service's goal would be to take all the dredged material by barge to an ocean dumping site. If this was not possible, the Park Service would seek ocean dumping for the uncontaminated portion of the dredged material, leaving only the contaminated portion for disposal on land. The contaminated portion would require up to 700 two-way truck trips for transport to a land disposal site. The truck traffic required to haul dredge material to a landfill would adversely affect city streets and traffic flow.

The relocation of maintenance to either the Essex Street site or the Fort Avenue site would introduce this function into a primarily residential area.

Relocation of visitor parking to the East India Square garage would help to better utilize an existing parking facility. The city, downtown businesses, and the Essex Street Mall would benefit economically from more visitors being brought into the downtown area. There would be an adverse effect on Pickering Wharf, since many of that area's patrons currently park in the National Park Service parking lot. Those patrons would have to either use the new shuttle system from the downtown lots or find parking in the areas Pickering has designated for its customers. Pickering Wharf intends to pursue use of other nearby lots. The designation of two tour bus parking spaces in front of Pickering Wharf should help encourage more business at Pickering Wharf while keeping the visual intrusion of large buses within the park boundaries to a minimum. Boaters using the new docking facilities on Central Wharf would purchase supplies and boating materials from shops in the Pickering Wharf area, providing an economic benefit to the area. The tour boat patrons would most likely increase visitation to Pickering Wharf's shops, as well.

Salem visitation has been estimated to be increasing by 5 percent per year (Bruce Campbell and Associates 1990a). Development of the national historic site would add to the city's varied opportunities and desirability to tourists. More tourists would be drawn to Salem's waterfront and this would help businesses in that area and probably in the city as a whole. This could have a positive impact on the local economy if more visitors tended to stay longer in Salem, purchasing more lodging, meals, and goods.

Employment opportunities and income generated by construction activities at the site might benefit the local economy for a short term. This might be offset by a decrease in visitor use and visitor expenditures during the period that the site was under construction. Noise levels in the neighborhood would temporarily increase as a result of construction activities at the historic site. The long-term noise and activity associated with boat-building operations might disturb people living and working near the eastern site boundary. Boat-building activity would occur during daytime hours, when most residents would be working outside the neighborhood.

Removal of the overhead power lines along Derby Street and placing them underground would affect the owners and residents of approximately 20 houses by requiring lines to be redesigned and replaced at all buildings and homes in the immediate area. The National Park Service would study this proposal further and would take action only if all adverse impacts on community residents could be mitigated. No major power service interruptions would be anticipated; however, there might be minor breaks in service during construction.

Removal of the two existing piers on Derby Wharf would eliminate a safety hazard. The few people who use the piers could dock on the west side of Central Wharf.

All the boats currently moored between Central and Derby wharves and on the west side of Central Wharf would need to find alternative mooring facilities. Moorings are currently available off of Winter Island. Additional boat activity along Central Wharf would cause increased crowding in the Pickering Wharf Marina area. All boats would dock parallel to the wharf. No dredging would be necessary. The tour boat movement in and out of the area would also have a slight impact on boat traffic in the South River Channel.

Alternative 3: Low-Profile Interpretive Media

Impacts on Visitors. Visitors' approach and orientation to the site would be the same as described for alternative 2.

In the absence of three-dimensional form on the wharves, visitors' attention would be focused on the concepts introduced by the audio vignettes and waysides. The success of the visitor experience would be more dependent upon individuals' abilities to translate two-dimensional art forms and stories into three-dimensional reality. The disadvantage of this alternative would be in not having the form to give visitors a sense of presence in the past based on a combination of sights, sounds, smells, and feelings. The advantage would be in not allowing the form and function of facilities to predominate over visitors' abilities to imagine more conceptual ideas related to the historical context of Salem's maritime trade and the evolution of the waterfront over time.

The site's attractiveness to local and regional visitors would not be as high as it would be under alternative 2 because of the lack of ships; consequently, less repeat visitation could be expected.

The unity between the north area, Derby Street, and the wharves would be weaker than in alternative 2 because the street would retain its current asphalt surfacing. There would be few visual linkages to connect the north and south areas, and an imbalance in form (with three-dimensional structures on the north and open space on the south) would make it harder for visitors to make the necessary connections.

Activities during inclement weather would be limited to the small contact station, the Custom House, the Derby house, and the West India Goods Store. No weatherproof facilities would exist on Derby Wharf to allow for wharf and harbor interpretation during bad weather.

The wharf open space would provide good views of the harbor and allow for neighborhood recreational activities, such as dog walking, spontaneous play, and running.

Impacts on Community Residents. Visitation to the park would increase somewhat, thus increasing tourism dollars in the local economy. The construction trades would benefit from short-term economic gains as in alternative 2.

The 15 parking spaces on Derby Street that would be a no-parking zone during the daytime hours would be replaced at a location within a half mile of the site. Residents and patrons of neighborhood establishments would be inconvenienced by having to walk farther from the new parking lot. Leaving seven spaces along Derby Street open for general parking during the day would allow some people to find more convenient parking.

The potential would exist for relocating maintenance functions into a primarily residential area, as described for alternative 2.

Alternative 4: Museum/Recreational Use

Impacts on Visitors. Most of the visitors would have the same approach to the site as in alternative 2. However, since the existing on-site parking lot would remain, some visitors would drive to the site. If on-site parking spaces were not found, visitors could become frustrated in their search for parking in the adjacent neighborhood.

Consolidating orientation and interpretive facilities in a large complex would make it easy for people to participate in a variety of interpretive programs. The tour boat drop-off next to the museum would be convenient to visitors and would require the least amount of walking to the orientation area of any alternative; however, visitors arriving on foot and by car would have to walk farther and travel to the center of the site before finding the contact station.

The ship deck exhibit and ghosted vessels next to Derby Wharf would provide the visual impression of a vessel in the site's harbor and represent the relationship between a vessel, wharf, and warehouse while being relatively inexpensive to maintain. However, it would appear as a stage set rather than as a real vessel. The ship deck would allow for above-deck interpretation. Below-deck interpretation would occur inside the museum.

The scale of the museum would be out of proportion on the site. This building would dominate the site and distract visitors' attention away from the historic structures north of Derby Street and therefore would reduce rather than strengthen the linkages between the two parts of the historic site.

Although the site's foreground harbor scene would present a historic visual image, the middle ground views would be of modern docks and boats. This modern visual intrusion would be more dramatic since the docks would need to be placed approximately 25 feet from the wharf to minimize wharf edge disturbance and to allow for adequate draft to accommodate modern boats. The modern dory piers on the east side of Derby Wharf would also remain as modern intrusions on the historic wharf scene.

Recreational use on the site would be enhanced by this alternative. A substantial quantity of open space would remain along the wharf adjacent to Derby Street and could be used for spontaneous play and other neighborhood recreational activities. However, the beach area would be less accessible to visitors than in the other alternatives because the shipbuilding exhibit would be in this location. More space would be available for modern boat docking than in the other alternatives.

The visitor experience would be interrupted by the intrusion of modern recreational uses on Derby Wharf, including boat users bringing personal boat supplies through this area. Such modern uses would create user conflicts and make it difficult for visitors to visualize the historic quality of the wharf or to use the end of the wharf for contemplation.

Impacts on Community Residents. Increases in visitation would benefit the local economy. Economic benefits to the area immediately surrounding the site would be greater because day-use sailboat docking and recreational use on Derby Wharf would attract more boaters and water-oriented tourists seeking services.

Keeping the Central Wharf parking lot open for visitor use might result in additional competition for parking spaces in the neighborhood surrounding the national historic site. Site constraints would make it impossible to expand the capacity of the Central Wharf lot as visitation increased; consequently, more visitors would expect but not find available parking at the site and would compete with residents for available on-street parking outside the historic site boundary. The impacts of prohibiting parking on the south side of Derby Street from 8 a.m. to 5 p.m. would be the same as described for alternative 2.

The museum building on Derby Wharf would block harbor views along the waterfront, detracting from the historic neighborhood character.

Noise from the boat-building operation would disturb people living and working in the neighborhood, as in alternative 2.

The addition of boat docks and resulting increase in boat traffic would increase traffic and crowding in the narrow federal navigation channel adjacent to Derby Wharf.

The potential would exist for relocating maintenance functions into a primarily residential area, as described for alternative 2.

COMPLIANCE WITH FEDERAL AND STATE LEGISLATION AND POLICIES

A considerable number of factors influence the compliance process for this site plan. The site's historic significance and location within a coastal environment, along with extensive state and federal permitting and environmental review requirements, create an involved process leading to final approvals and construction. A series of permits and approvals are required for work in the coastal zone in Massachusetts, and one approval often must be obtained before applying for the next. A list of anticipated permits and pertinent regulations is included below. Jason M. Cortell and Associates will assist the National Park Service in preparing and obtaining all necessary permits and approvals. This site plan will comply with all applicable legislation and orders.

NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (42 USC 4321 et seq.)

The National Environmental Policy Act requires consideration of environmental effects of proposed federal actions. The procedures for implementing the act ensure that public officials and members of the general public have the opportunity to review environmental information and impacts before decisions are made on a project. This *Environmental Assessment* is the document that provides for review and further action under the act.

SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED (16 USC 470 et seq.)

The National Park Service is operating under a programmatic agreement with the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers implemented in August 1990. That agreement provides for periodic consultation with the Advisory Council and the state historic preservation officer throughout the planning process and allows either entity to participate as full team members should they so desire. The programmatic agreement also contains a listing of programmatic exclusions, which are actions that, because of the nature of the action and the minor impact on the resources involved, do not require further review and consultation with the Advisory Council or the state historic preservation officer. All other actions discussed in a plan must be further reviewed by those entities during the design stage prior to implementation.

With regard to the Salem Maritime *Site Plan*, both the Massachusetts historic preservation officer and the Advisory Council on Historic Preservation were notified when planning began and were invited to participate. Meetings were held to brief their representatives, giving them an understanding of the issues, the alternatives, and the identified solutions. Both meetings were highly productive and useful.

This *Environmental Assessment* will be submitted for formal review by the Advisory Council and the state historic preservation officer. Any comments they may have will be addressed in the final document.

A listing of all the actions included in the planning alternatives and whether or not they require further review under the terms of the programmatic agreement is included in appendix C. When it is time to implement an action outlined in the site plan, those actions described in the appendix as a programmatic exclusion will require only a completed XXX

(Assessment of Effect on Cultural Resources) form prior to implementation. Those actions not described as programmatic exclusions must undergo further consultation with the state historic preservation officer and the Advisory Council on Historic Preservation under the requirements of section 106 of the National Historic Preservation Act and the "Regulations for the Protection of Historic and Cultural Properties" (*Code of Federal Regulations*, title 36, part 800).

ARCHITECTURAL BARRIERS ACT OF 1968 (42 USC 4151 et seq.)
REHABILITATION ACT OF 1973 (29 USC 701 et seq.)

All proposed facilities and programs will be accessible to special populations.

SECTIONS 404 AND 401 OF THE CLEAN WATER ACT (33 USC 1344)
SECTION 10 OF THE RIVERS AND HARBORS ACT OF 1899 (33 USC 401 et. seq)
SECTION 103 OF THE MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT (16 USC 1431-1434)

The U.S. Army Corps of Engineers issues permits for work affecting navigable waters and wetlands of the United States. Construction requires a section 10 permit; discharge of dredged or fill material, a section 404 permit; and transport and disposal of material in ocean waters, a section 103 permit. The proposed rehabilitation of Central, Derby, and Hatch's wharves, the dredging of portions of the adjacent harbor waters, and the ocean transport and disposal of dredged material will require Corps of Engineers permits under the above authorities. In addition, all projects requiring a federal license or permit that might result in a discharge into navigable waters of the state are subject to the state's water quality certification program as a result of delegation of authority under section 401 of the Clean Water Act. This certification is required prior to obtaining other state permits, such as permits required under the Wetlands Protection Act and chapter 91 of the Massachusetts General Laws, outlined below. Sixty to 90 days are required to complete the review of the application and to obtain certification.

Extensive consultation has occurred between the National Park Service and the New England Division of the Corps of Engineers Regulatory Branch to conduct proper testing for the disposal of dredged material under guidelines published by that division and by the Environmental Protection Agency. The guidelines require preparation of a system of tiered reports: The tier I report assesses the site conditions and potential contamination problems; tier II analyzes chemical contamination; and tier III documents bioassay and toxicity testing of the site's dredged materials if ocean disposal is selected.

MASSACHUSETTS ENVIRONMENTAL POLICY ACT (Massachusetts General Laws, chapt. 30, sec. 61-62H; 301 CMR 11.00)

The Massachusetts Environmental Policy Act (MEPA) is the state level equivalent of the National Environmental Policy Act. All actions involving funding or issuance of permits by state agencies are potentially subject to its provisions. Consultations with the state indicate that this project will require the National Park Service to file an environmental notification form, which will be the vehicle for determining the scope and review requirements of the project and for circulating the project for review among pertinent state agencies.

A 30-day review is required for the environmental notification form, and 30-day reviews are also required for draft and final environmental impact reports. Under this act the state may, at its discretion, hold public meetings regarding the project separate from the public meetings scheduled by the National Park Service for the public review process under NEPA.

The National Park Service has been consulting and will continue to work with the Massachusetts Environmental Policy Act Office to integrate their concerns and requirements into the planning process for this project.

COASTAL ZONE MANAGEMENT ACT OF 1972 (16 USC 1451 et seq.)

MASSACHUSETTS COASTAL ZONE MANAGEMENT ACT (301 CMR 21.00)

As provided by the Coastal Zone Management Act and the *Code of Massachusetts Regulations*, projects requiring a federal license or permit that might affect the coastal zone must be accompanied by a certification of consistency stating that the proposed activity complies with the policies of the state's approved coastal zone management program. No federal license or permit will be issued until the consistency certification is concurred with by the Massachusetts Coastal Zone Management Office. The MEPA process is the primary vehicle for assuring compliance at the state level with Massachusetts coastal zone management policies. The coastal zone management coordinator has been consulted during the planning process for this project.

EXECUTIVE ORDER 11988, "FLOODPLAIN MANAGEMENT"

EXECUTIVE ORDER 11990, "PROTECTION OF WETLANDS"

MASSACHUSETTS WETLANDS PROTECTION ACT, ORDER OF CONDITIONS (Massachusetts General Laws, chapt. 131, sec. 40; 310 CMR 10.00)

Executive Order 11988, "Floodplain Management," requires all federal agencies to avoid construction within the 100-year floodplain unless no other practical alternative exists. Construction within a 100-year floodplain, as is proposed in this plan, will require that a statement of findings be prepared to accompany the finding of no significant impact.

Executive Order 11990, "Protection of Wetlands," requires federal agencies to avoid, where possible, impacts on wetlands. The statement of findings will address any concerns for wetlands and also any permitting actions required under section 404 of the Clean Water Act and any state requirements.

The Massachusetts Wetlands Protection Act covers resource areas with potential relevance to this project, such as coastal banks, wetlands, flats, and beach; land subject to tidal action or coastal 100-year storm flowage; and land under the ocean. Protected interests for this project include protection of marine fisheries, protection of land containing shellfish, storm damage protection, flood control, and prevention of pollution. To initiate the review process, a notice of intent is filed with the Salem Conservation Commission. Within 21 days of receipt, a public meeting is called, and a decision from the commission is rendered 21 days from the close of the public hearing. The Conservation Commission issues an order of conditions to allow for further state permitting to occur. Consultation has been initiated with the Conservation Commission chairman in Salem.

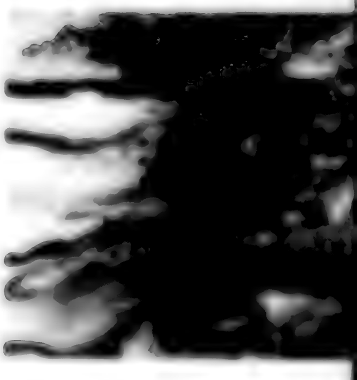
CHAPTER 91 OF THE MASSACHUSETTS GENERAL LAWS (Massachusetts General Laws, chapt. 91; 310 CMR 9.00)

Chapter 91 of the Massachusetts General Laws requires licensing of the placement of structures or fill, licensing of dredging, and the permitting of certain other activities in state waterways, including among other areas, existing or filled former commonwealth tidelands. A chapter 91 license with its implementing regulations is granted when a project file contains complete plans and specifications, a statement of how the project serves a proper public purpose and provides public benefits in excess of detriments, and evidence of compliance with all other applicable federal, state, and local permits and approvals. The National Park Service has consulted with staff responsible for chapter 91 licensing during the planning process.

SITE ASSIGNMENT REGULATIONS FOR SOLID WASTE FACILITIES (310 CMR 16.00)

The possibility exists that some or all of the dredged material or other solid waste from the rehabilitation work on the wharves will require a land disposal site capable of handling the material. The site must have a valid site assignment to accept wastes, or one must be obtained from the local Board of Health and Department of Environmental Protection. Negotiations with the landfill owner should precede an application for a site assignment to ensure the materials can be accepted. The National Park Service will pursue consultations with the landowners and appropriate agencies if land disposal is necessary.

APPENDIXES



BLANK PAGE

APPENDIX A: COST ESTIMATES

OPERATIONS AND MAINTENANCE COSTS FOR SITE PLAN ALTERNATIVES

Tables A-1 through A-4 show the existing and projected operations and maintenance costs for the alternatives. Operational costs cover staffing. (Note that staffing for the proposed Salem Project visitor center is not included.) Maintenance costs cover equipment and materials. Maintenance costs for alternatives 2 through 4 are estimated as 5 percent of the gross development costs shown in tables A-5 through A-7. Development costs for areas that will not be maintained by the park were not included when the maintenance costs were estimated.

TABLE A-1: EXISTING OPERATIONS AND MAINTENANCE COSTS

	FTE	Salary or Annual Cost[1]
Operations (Staffing)		
Permanent Full-Time		
Superintendent (GS-12)	1.0	$ 41,763
Administrative Officer (GS-9)	1.0	31,992
Clerk-typist (GS-4)	1.0	12,483
Supervisory Park Ranger (GS-9)	1.0	31,848
Supervisory Park Ranger (GS-7)	1.0	26,915
Park Ranger (Historian) (GS-7)	1.0	27,183
Park Ranger (Interpreter) (GS-5)	1.0	26,005
Park Ranger (Law Enforcement) (GS-5)	2.0	49,318
Museum Curator (GS-9)	1.0	30,881
Maintenance Foreman (WG-8)	1.0	37,695
Maintenance Mechanic (WG-9)	1.0	31,717
Painter (WG-9)	1.0	30,694
Maintenance Worker (WG-7)	1.0	28,632
Subtotal	14.0	$406,721
Temporary/Seasonal		
Laborer (GS-3)	0.3	6,874
Clerk-typist (GS-2)	0.7	11,094
Park Ranger	4.2	65,767
Subtotal	5.2	$ 83,735
Total	19.2	$490,456
Vacant/Unfunded		
Secretary (GS-5)	1.0	23,961
Park Ranger (GS-4)	2.0	46,427
Museum Technician (GS-5)	1.0	21,848
Laborer (WG-3)	2.0	45,930
Administrative Clerk (GS-5)	1.0	25,206
Subtotal		$162,972
Maintenance		$109,544
Summary		
Staffing		$490,456
Maintenance		109,544
Total		$600,000

---

[1] Annual Salary - 1990 Rates. Includes FERS (additional 20% for full-time employees, 7.5% for seasonals)

TABLE A-2: PROJECTED ADDITIONAL OPERATIONS AND MAINTENANCE COSTS, ALTERNATIVE 2

	FTE	Salary or Annual Cost[1]
Operations (Staffing)		
Wharves - Includes warehouse area, vessel, and boat building area:		
Supervisory Park Ranger (GS-7)	1.0	$ 29,990
Park Rangers (GS-5)	2.0	48,427
3 Seasonal Park Rangers (GS-4)[2]	1.8	31,961
Programmed Vessels/Special Events/Public Affairs (east side of central wharf)		
Park Ranger (GS-7)	1.0	29,990
Security/Law Enforcement/Protection		
Supervisory Park Rangers (GS-7)	1.0	29,990
Park Rangers (GS-5)	2.0	48,427
Derby House/Narbonne House		
Park Ranger (GS-5)	1.0	24,214
Interpretive Support Staff		
Secretary (GS-5)	1.0	23,737
Maintenance		
Maintenance Managrment Clerk (GS-5)	1.0	23,737
Laborers (WG-5)	2.0	49,815
Vessel Supervisor (WS-9)	1.0	39,145
Vessel Rigger (WG-10)	1.0	30,901
Vessel Carpenter (WG-10)	1.0	30,901
Administration:		
Purchasing Clerk (GS-7)	1.0	28,172
Personnel Clerk (GS-7)	1.0	28,172
Clerk Typist (GS-4)	0.5	11,253
Total	19.3	$508,832
Maintenance		$255,800
Summary		
Staffing	16.3	$408,000
Maintenance		255,800
Ship Staff[3]	3.0	101,000
Ship Maintenance[3]		60,000
Shuttle Service (NPS Operations)[3]		85,000
Total		$909,800

---

[1] Annual Salary - 1990 Rates. Includes FERS (additional 33% for full-time employees, 7.5% for seasonals)

[2] One seasonal = 0.6 FTE

[3] Costs of the ship and shuttle could be partially or entirely recouped through minimal user fees

TABLE A-3: PROJECTED ADDITIONAL OPERATIONS AND MAINTENANCE COSTS, ALTERNATIVE 3

	FTE	Salary or Annual Cost[1]
Operations (Staffing)		
Wharves:		
Supervisory Park Ranger (GS-7)	1.0	$ 29,990
Park Rangers (GS-5)	3.0	72,641
5 Seasonal Park Rangers (GS-4)[2]	3.0	53,268
Derby House/Narbonne House		
Park Ranger (GS-5)	1.0	24,214
Interpretive Support Staff:		
Secretary (GS-5)	0.5	11,869
Administration:		
Purchasing Clerk (GS-7)	1.0	28,172
Personnel Clerk (GS-7)	1.0	28,172
Clerk Typist (GS-4)	0.5	11,253
Total	11.0	$259,579
Maintenance		$77,970
Summary		
Staffing	11.0	$259,600
Maintenance		77,970
Shuttle[3]		85,000
Total		$422,570

---

[1] Annual Salary - 1990 Rates. Includes FERS (additional 35% for full-time employees, 7.5% for seasonals).

[2] One seasonal = 0.6 FTE.

[3] Shuttle costs could be partially or entirely recouped through minimal user fees.

TABLE A-4: PROJECTED ADDITIONAL OPERATIONS AND MAINTENANCE COSTS, ALTERNATIVE 4

	FTE	Salary or Annual Cost[1]
Operations (Staffing)		
Wharves:		
Supervisory Park Ranger (GS-7)	1.0	$ 29,990
Park Rangers (GS-5)	2.0	48,427
3 Seasonal Park Rangers (GS-4)[2]	1.8	31,961
Recreational Docks (west side of Central Wharf):		
Park Rangers (GS-5)	2.0	48,427
Programmed Vessel/Special Events/ Public Affairs (east side of Central Wharf):		
Park Ranger (GS-7)	1.0	29,990
Parking Lot[3]		
Park Rangers (GS-5)	2.0	48,427
Seasonal Park Rangers (GS-4)	1.2	21,307
Security/Law Enforcement/Protection:		
Supervisory Park Rangers (GS-7)	1.0	29,990
Park Rangers (GS-5)	2.0	48,427
Derby House/Narbonne House:		
Park Ranger (GS-5)	1.0	24,214
Interpretive Support Staff:		
Secretary (GS-5)	1.0	23,737
Maintenance:		
Maintenance Management Clerk (GS-5)	1.0	23,737
Laborers (WG-5)	3.0	74,723
Administration:		
Purchasing Clerk (GS-7)	1.0	28,172
Personnel Clerk (GS-7)	1.0	28,172
Clerk Typist (GS-4)	0.5	11,253
Total	22.4	$550,954
Maintenance		$407,082
Summary		
Staffing	22.4	$ 550,954
Maintenance		407,082
Shuttle[4]		85,000
Total		$1,043,036

---

1. Annual Salary – 1990 Rates. Includes FERS (additional 35% for full-time employees, 7.5% for seasonals).
2. One seasonal = 0.6 FTE.
3. Assumes hours of operation as follows:
   April 1 – October 31, 7:00 a.m. – 9:00 p.m.
   November 1 – March 31, 8:30 a.m. – 5:00 p.m.
   During the summer months, two shifts would be needed; during the winter months, one shift.
4. Shuttle costs could be partially or entirely recouped through minimal user fees.

DEVELOPMENT COST ESTIMATES

Tables A-5 through A-7 show the estimated development costs of the alternatives. Costs are class C estimates. The costs of purchasing the maintenance property and neighborhood parking replacement and the Salem Project visitor center are not included. The rehabilitation of the wharves has been funded and is not shown in this cost estimate.

TABLE A-5: DEVELOPMENT COST ESTIMATES, ALTERNATIVE 2

Development Item	Gross Costs	Advanced & Project Planning	Total Costs
Derby Street			
Pavement removal	$ 24,100	$ 4,600	$ 28,700
Historic surface, curbing, special paving at crossings	379,000	71,000	450,000
Lighting, bollards, and signs	84,000	16,000	100,000
Overhead power line burial	420,000	80,000	500,000
Entrance sign and landscaping	36,025	6,875	42,900
Derby Wharf			
Main pedestrian walk, secondary walkways, lighting, and benches	91,000	17,900	108,900
Interpretive waysides (5)	25,200	4,800	30,000
Reconstructed ship	2,099,000	401,000	2,500,000
Ship exhibits	420,000	80,000	500,000
Buildings (3) and ghosts (3)	1,700,000	325,000	2,025,000
Building exhibits	1,300,800	248,000	1,548,800
Building outlines	78,000	15,000	93,000
Wharf interpretive aids	375,000	72,000	447,000
Central Wharf			
Main pedestrian walk, lighting, and benches	34,000	6,500	40,500
Interpretive waysides (4)	15,400	8,600	24,000
Picnic area: tables, paving, and landscaping	73,400	14,000	87,400
Ghosted Forrester warehouse and site development	131,650	25,150	156,800
Floating dock (handicapped accessible) for tour boats and day-use vessels (8' x 100')	62,900	12,000	74,900
Restrooms/shower facility & removal of existing restroom	152,000	29,000	181,000
Staging area	77,900	14,900	92,800
Parking lot removal	21,500	4,100	25,600
Shipbuilding Area			
Exhibit	192,300	107,700	300,000
Interpretive waysides (2)	7,700	4,300	12,000
North Area			
Cargo exhibits at the bonded warehouse	13,000	2,900	15,900
Bollards	1,950	550	2,500
Interpretive waysides (4)	20,200	3,800	24,000

Development Item	Gross Costs	Advanced & Project Planning	Total Costs
Maintenance and Neighborhood Parking			
4,000 sq ft maintenance facility and 22-car parking lot	622,250	118,750	741,000
Shuttle Bus			
Purchase shuttle bus (2)			90,000
Totals	$8,458,2755	$1,693,625	$10,241,900
Plus 15% contingency			$11,778,185

TABLE A-6: DEVELOPMENT COST ESTIMATES, ALTERNATIVE 3

Development Item	Gross Costs	Advanced & Project Planning	Total Costs
Derby Street			
Pedestrian crossing: special pavement	$ 53,000	$ 10,000	$ 63,000
Lighting, bollards, and signs	84,000	16,000	100,000
Overhead power line burial	420,000	80,000	500,000
Derby Wharf			
Main pedestrian walk, secondary walkways, lighting, and benches	91,000	17,400	108,400
Interpretive panels: six 40' x 10' panels	503,850	96,150	600,000
Central Wharf			
Main pedestrian walk, lighting, and benches	33,000	6,900	39,900
Staging area, seating, and props	93,900	18,000	111,900
Interpretive waysides (1 large)	18,300	5,700	24,000
Floating dock (handicapped accessible) for tour boat and day-use vessels (8' x 100')	62,900	12,000	74,900
Parking lot removal	21,500	4,100	25,600
North Area			
Entrance sign at Narbonne house	6,550	1,250	7,800
Interpretive waysides (4)	20,200	3,800	24,000
Bollards	1,950	550	2,500
Maintenance and Neighborhood Parking			
4,000 sq ft maintenance facility and 22-car parking lot	622,250	118,750	741,000
Shuttle Bus			
Purchase shuttle bus (2)			90,000
Totals	$2,032,400	$ 390,600	$3,513,000
Plus 15% contingency			$4,039,950

TABLE A-7: DEVELOPMENT COST ESTIMATES, ALTERNATIVE 4

Development Item	Gross Costs	Advanced & Project Planning	Total Costs
Derby Street			
Pavement removal	$ 24,100	$ 4,600	$ 28,700
Historic surface, curbing, special paving at pedestrian crossings	304,200	58,100	362,300
Lighting, bollards, and signs	84,000	16,000	100,000
Overhead power line burial	420,000	80,000	500,000
Entrance sign and landscaping	36,025	6,875	42,900
Derby Wharf			
Museum building	2,351,280	448,720	2,800,000
Museum exhibits	3,019,000	385,000	3,404,000
Ship deck on piles	245,600	46,900	292,500
Pier and floating dock for dory tie-up	73,100	14,000	87,100
Interpretive waysides (5)	25,200	4,800	30,000
Tour boat and sailboat dock	440,200	84,000	524,200
Main pedestrian path, lighting, and benches	84,200	16,100	100,300
Ghosted vessels on the water (3)	327,500	62,500	390,000
Central Wharf			
Main pedestrian walk, lighting, and benches	34,000	6,500	40,500
Floating dock (handicapped accessible) for tour boats and day-use vessels (8' x 500')	314,500	60,000	374,500
Restrooms/shower facility and removal of existing restroom	152,000	29,000	181,000
Redesigned parking lot	85,150	16,250	101,400
Shipbuilding Area			
Exhibit	192,300	107,700	300,000
Interpretive waysides (4)	20,200	3,800	24,000
North Area			
Cargo exhibits at the bonded warehouse	13,000	2,500	15,500
Interpretive waysides (4)	20,200	3,800	24,000
Bollards	1,950	550	2,500
Maintenance and Neighborhood Parking			
4,000 sq ft maintenance facility and 22-car parking lot	622,250	118,750	741,000
Shuttle Bus			
Purchase shuttle bus (2)			90,000
Totals	$8,889,955	$1,576,445	$10,556,400
Plus 15% contingency			$12,139,860

APPENDIX B: TEST DATA RELATING TO ENVIRONMENTAL QUALITY

WATER QUALITY

Three stations were sampled in the park (see the Natural Resources map). Two stations measured grab samples under dry and wet weather conditions. A one-time two-hour composite sample was collected at an outfall near Central Wharf under dry and wet weather conditions.

Results indicate that water quality under dry weather conditions, with minor exceptions, generally meets applicable class SB water quality standards. Dissolved oxygen was found to be above the 5.0 mg/l (milligrams per liter) minimum throughout the water column. Differences in temperature and dissolved oxygen levels between surface and bottom samples indicate that station W-2 is influenced by the confined physical conditions between the wharves and the turbulent tidal changes that occur there. Station W-1 displays mostly normal open water conditions. No total or fecal coliform was detected in the dry weather samples, and pH was within the allowed range of 6.5 to 8.5 units.

With the exception of copper, all metals were found to be within the national water quality standards established by the U.S. Environmental Protection Agency (May 1986). Copper was found to exceed the standard of 29 mg/l by 71 mcg/l (micrograms per liter). Earlier concerns in a 1975 Massachusetts Department of Marine Fisheries report on the effects of adding a fourth generator at the nearby power plant indicated that copper contamination could be a problem caused by the plant's emission of cooling waters into Salem Harbor. The other exception to meeting class SB water quality standards is the average concentration of suspended solids, which exceeds the maximum standard of 25 mg/l with 52 mg/l average concentrations found.

The dry weather composite sample from the outfall station found colony-forming units for fecal coliform bacteria to be within the standard criteria. However, colony-forming units might not always represent true conditions. High biochemical oxygen demand (relative to levels in other harbor waters) was found, and elevated phosphorous, Kjeldahl, and ammonia nitrogen was also indicated. The data suggest that sampled waters are weak- to medium-strength wastewater, indicating the outfall to be characteristic of a combined sewer overflow.

Wet weather water quality exhibited higher pollution counts. During a 0.25-inch rainfall event, fecal coliform concentrations were found to exceed class SB water quality standards. Hydrogen-ion and dissolved oxygen were found to be acceptable, although both stations indicated an excess of suspended solids (a range of 35-75 mg/l compared to the standard of 25 mg/l). Total Kjeldahl and ammonia nitrogen were elevated at station W-1. Copper was found slightly in excess of the national standard of 29 mg/l. Some dilution was evident during wet weather conditions, with salinity measuring 30 to 34 ppt (parts per thousand) at a depth of 4 meters.

Water from the outfall at station W-3 during wet weather conditions was found to be highly contaminated with fecal coliform and fecal streptococcus bacteria too numerous to count. Suspended solids were higher than under dry conditions, most likely as a result of urban runoff.

TABLE B-1: WATER QUALITY DATA

Parameter	Station W-1	Station W-2	Station W-3
Wet Weather			
Total Coliform (No./100ml)	1,400	1,200	TNTC*
Fecal Coliform (No./100ml)	500	260	32
Fecal Streptococcus (No./100ml)	200	2,400	TNTC
Total BOD_5 (mg/l)	<1.0	<1.0	18
Total Phosphorus (mg/l)	0.08	0.08	1.3
pH (units)	8.09	8.05	8.07
Nitrate (mg/l as N)	<0.25	<0.25	0.59
Total Suspended Solids (mg/l)	75	35	100
Alkalinity (mg $CaCO_3$/l)	110	110	55
Total Kjeldahl Nitrogen (mg/l)	4.8	0.52	7.5
Ammonia (mg/l as N)	2.3	0.33	7.1
Arsenic, total (mg/l)	<0.1	<0.1	<0.1
Cadmium, total (mg/l)	<0.005	<0.005	<0.005
Chromium, total (mg/l)	0.01	<0.01	0.01
Copper, total (mg/l)	0.04	0.06	0.07
Lead, total (mg/l)	<0.05	<0.05	0.05
Mercury, total (mg/l)	<0.0003	<0.0003	<0.0003
Nickel, total (mg/l)	<0.03	<0.03	0.05
Zinc, total (mg/l)	<0.02	<0.02	0.16
Dry Weather			
Total Coliform (CFU/100ml)	<1	<1	75
Fecal Coliform (CFU/100ml)	<1	<1	3
Total BOD^3 (mg/l)	<1	<1	75
Total Phosphorus (mg/l)	0.08	0.08	9.5
pH (units)	8.07	8.00	7.37
Nitrate (mg/l as N)	<0.25	<0.25	0.9
Total Suspended Solids (mg/l)	50	53	38
Alkalinity (mg $CaCO_3$/l)	106	100	190
Total Kjeldahl Nitrogen (mg/l)	0.52	0.62	24
Ammonia (mg/l as N)	<0.2	<0.2	24
Arsenic, total (mg/l)	<0.04	<0.04	<0.01
Cadmium, total (mg/l)	0.018	0.020	0.012
Chromium, total (mg/l)	<0.01	<0.01	<0.01
Copper, total (mg/l)	0.10	0.10	<0.02
Lead, total (mg/l)	<0.01	<0.005	<0.005
Mercury, total (mg/l)	<0.0003	<0.0003	<0.0003
Nickel, total (mg/l)	<0.03	<0.03	<0.03
Zinc, total (mg/l)	<0.02	<0.02	0.02

*TNTC - Too Numerous To Count

SEDIMENT QUALITY

Bulk Chemical Analysis

On Derby and Central wharves, test pits and sediment cores were taken at various locations to assess a variety of pollutants, including heavy metals and organic and inorganic compounds. Sample locations are noted on the Natural Resources map. The testing showed no detectable concentrations of pesticides or PCBs in the landward samples or evidence of volatile organics in the soils. Petroleum hydrocarbons were found in low concentrations relative to state standards. Leachable chloride concentrations were relatively high for disposal at inland sites away from marine environments.

All metals on the landward soils with the exception of lead and mercury were found in low concentrations and within acceptable limits. Lead was found to have an average concentration of 238 mcg/g within a range of 16 to 570 mcg/g, compared to acceptable limits considered to be 100 mcg/g and less. Mercury concentrations were found between and 1.5 mcg/g, with an average concentration of .57 mcg/g. Likely sources of lead and mercury are the harbor sediments used as fill over the years, along with metal and timber treated with mercuric acid, which was once used as a fungicide and wood preservative. With the exception of test pit number 4 the higher lead levels were found at deeper soil levels.

Physical and bulk chemical analyses of harbor sediments were conducted in areas surrounding the wharves. Physical analysis was conducted at two levels to determine soil qualities and grain sizes. These results indicated silty marine sediments with sand and lesser quantities of gravel and clay.

Bulk chemical analysis was conducted on sediment test cores according to standard procedures required by the Army Corps of Engineers and the Massachusetts Department of Environmental Protection. Results were compared to the "Massachusetts Criteria for Classification of Dredge or Fill Material" (*Code of Massachusetts Regulations*, title 314, part 9.00). Three categories are used to classify contamination levels. Category I sediments are considered uncontaminated, category II are moderately contaminated, and category III are highly contaminated. In addition, soil substrate is also classified by certain types.

Core samples were taken from six locations around the wharves, including areas that had potential for dredging or wharf rehabilitation activities. Results for these samples are summarized in table B-2 and the sampling locations are noted on the Natural Resources map. Sediment quality varied between surface and deeper materials and among testing locations. Some elements were found at high levels; however, extraction procedure toxicity testing indicated that the contamination on site is not hazardous, and there was no release of metals into the water during elutriate testing.

Stations BW-1, BW-2, and S-6 are the sample locations associated with the proposed dredging area. At station BW-1, 270 feet from a suspected combined sewer outfall, surface sediments were found to be highly contaminated with some elements and of category III quality. High levels of lead and mercury were found, with moderate contamination levels for arsenic and zinc. No pesticides or PCBs were found, and PAH concentrations were low to moderate (higher at the surface than at lower levels). Deeper sediments at BW-1 (1.9 to 10.0 ft) were found to be uncontaminated and of Category I quality.

BW-2, off of Central Wharf, had no pesticides or PCBs, and chemical analysis discovered Category I sediments from 1.6 feet to 7.5 feet. PAH concentrations were low. This station had some of the lowest contamination values of the six test locations for all levels of testing.

S-6 was a surface sediment sample from 0.0-0.5 feet and indicated high values for chromium and lead with moderate contamination values for mercury and zinc.

The following stations are associated with sites that were thought to have potential for dredging when testing occurred but have since been eliminated from further dredging consideration. BW-3, on the western edge of Derby, had more contamination at lower depths. Lead was very high between 5- and 6-foot depths, with high levels of PAH compounds at lower depths as well. Contamination from a wide variety of fill materials is the likely source for elevated levels at this location. BW-4 had uncontaminated sediments with no PCBs or pesticides. All other values were very low. BW-5 had underwater obstructions, but surface sample 5-2 indicated uncontaminated sediments within the category I levels, with the exception of chromium, which was within the category III level. BW-6 had all uncontaminated values with no PCBs or pesticides.

Biological Testing

The ecological assessment of the proposed dredged material employed three test organisms considered by the Environmental Protection Agency and the U.S. Army Corps of Engineers to be sensitive and appropriate for testing. One solid phase bioassay test was conducted using the amphipod *Ampelisca abdita*, the bivalve *Macoma nasuta*, and the sand worm *Nereis virens*. The exposure periods were 10 days for *Ampelisca* and 28 days for *Macoma* and *Nereis* using flow-through systems. The tissues of surviving *Macoma* and *Nereis* were analyzed for arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc, PAH compounds, PCB's, and pesticides.

The amphipod species showed 40 percent mortality, which was above the newly designated 10 percent mortality rates established in the U.S. EPA ocean dumping regulations. The clam and worm species did not show significant mortality rates.

The bioaccumulation tests showed a six-fold increase in chromium to 4.5 mg/kg and a three-fold increase in lead to 3.0 mg/kg. The chromium in Salem Harbor, however, is noted in the lab's conclusions as "trivalent chromium," which is a relatively nontoxic metal with low fish toxicity (10,300 ug/l) and low human toxicity (170 mg/l drinking water limit). The lab notes also mention that the cadmium levels of mg/kg were low, even though the clams experiencd bioaccumulation. Amphipods, which had the highest mortality rates, also have a recruitment or recovery time of 2-3 months compared with 24-36 months for the clam and worm species. Thus, the lab notes conclude that "the amphipod toxicity results should be evaluated as less significant than the clam or worm mortality and/or bioaccumulation."

No test organisms were found to bioaccumulate any compounds in excess of the Food and Drug Administration action levels for seafood. Although a maximun ten-fold increase could occur in the food chain through predation by fish, the limits of 5 ppm for pesticides, 1.0 ppm for mercury, and 3 ppm for PCBs would not be violated according to the lab results.

TABLE B-2: BULK SEDIMENT CHEMICAL ANALYSIS

Parameter	BW-1 0.0-1.9'	BW-1 1.9-3.8' 8.0-10.0'	S-6 0.0-0.5'	BW-2 1.6-4.4'	BW-2 5.5-7.5'
Arsenic, total	12	3	7	6	4
Cadmium, total	2.8	0.4	2.2	0.6	0.7
Chromium, total	87	18	770	36	33
Copper, total	170	14	110	11	11
Lead, total	520	11	260	16	16
Mercury, total	2.4	<0.02	1.0	<0.04	<0.04
Nickel, total	24	12	24	21	20
Zinc, total	340	35	200	50	48
Naphthalene	BDL	BDL	BDL	BDL	BDL
Acenaphthylene	0.7	BDL	BDL	BDL	BDL
Acenaphthene	0.6	BDL	0.5	BDL	BDL
Fluorene	0.9	BDL	0.8	BDL	BDL
Phenanthrene	4.3	BDL	1.5	BDL	BDL
Anthracene	1.3	BDL	0.9	BDL	BDL
Fluoranthene	4.4	BDL	3.2	BDL	BDL
Pyrene	6.4	BDL	3.3	BDL	BDL
Benzo(a)anthracene	2.5	BDL	1.6	BDL	0.4
Chrysene	3.4	BDL	2	BDL	BDL
Benzo(b) and Benzo(k) Fluoroanthene	4.6	BDL	3.8	BDL	BDL
Benzo(a)pyrene	2	BDL	1.9	BDL	BDL
Ideno(1,2,3-c,d)pyrene and Dibenzo(a,h,)anthracene	1.7	0.6	1.6	BDL	1
Benzo(g,h,i)perylene	0.8	BDL	1.5	BDL	0.5
Total PAH	32.0	0.6	22.6	0	1.9
Total Organic Carbon	100,000	21,000	93,000	21,000	37,000
Pesticides	BDL	BDL	BDL	BDL	BDL
PCBs	BDL	BDL	BDL	BDL	BDL
Moisture(%)	58.3	21.3	74	41.8	44.5

All results expressed in ug/g dry weight, unless otherwise noted.
BDL Below detection limit

TABLE B-3: TOXICITY SUMMARY

	Test Species		
Sediment	***Ampelisca abdita***	***Macoma nasuta***	***Nereis virens***
Control 1	25	29	20
Control 2	25	30	20
Control 3	23	30	20
Mean	24.3	29.7	20
Percent Surviving	81	99	100
Reference 1	26	30	20
Reference 2	21	29	20
Reference 3	24	29	20
Reference 4	19	29	20
Reference 5	22	29	20
Mean	22.4	29.2	20
Percent Surviving	75	97	100
Dredge 1	10	29	20
Dredge 2	9	29	18
Dredge 3	10	28	20
Dredge 4	13	30	20
Dredge 5	10	28	20
Mean	10.4*	28.8	19.6
Percent Surviving	35	96	98
Percent Difference Between Reference and Dredge	40	<1	2

*-Indicates a statistically significant difference between exposure to the Reference and Dredge Sediments.

TABLE B-4: BIOACCUMULATION SUMMARY
(mean tissue concentrations in mg/kg wet weight)

Chemical Parameter	Pretest *Macoma*	Pretest *Nereis*	Control *Macoma*	Control *Nereis*	Reference *Macoma*	Reference *Nereis*	Dredge *Macoma*	Dredge *Nereis*
Arsenic	0.049	0.037	0.042	0.057	0.08	0.057	0.073	0.063
Cadmium	0.10	0.137	0.14	0.116	0.099	0.10	0.16^{*h}	0.21^{*h}
Chromium	0.41	0.928	0.471	0.741	0.81	0.42	4.47^{*h}	0.56^{*m}
Copper	1.96	1.825	2.76	2.437	2.34	1.67	3.38^{*m}	2.06
Lead	0.37	0.292	0.712	0.348	1.13	0.36	3.07^{*h}	0.66^{*h}
Mercury	0.034	0.0275	0.04	0.063	0.027	0.03	0.067^{*m}	0.046^{*m}
Nickel	0.31	0.720	0.365	0.508	0.537	0.37	0.62	0.29
Zinc	7.77	13.09	9.07	14.833	8.78	12.12	8.50	12.82
Total PAH	BDL	BDL	BDL	BDL	BDL	BDL	0.844^{*h}	0.281^{*h}
Total PCBs	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.005

*h - Indicates a high significant difference between exposure to the Reference and Dredge Sediments.

*m - Indicates a minor significant difference between exposure to the Reference and Dredge Sediments.

BDL - Below Detection Limit of 0.020 mg/kg.

APPENDIX C: ACTIONS REQUIRING FURTHER CONSULTATION UNDER SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

The following list shows those actions requiring further consultation with the Massachusetts historic preservation officer and the Advisory Council on Historic Preservation under section 106 of the National Historic Preservation Act of 1966, as amended, and the programmatic memorandum of agreement completed among the three parties in August 1990.

Alternative 1 (No Action)

Repairs made to Central Wharf other than routine maintenance to preserve the present appearance	Requires SHPO/ACHP review
Removal of deteriorated nonhistoric wooden piers attached to Derby Wharf	Requires SHPO/ACHP review
Removal of power poles along Derby Street and undergrounding of power lines	Does not require further SHPO/ACHP review

Alternative 2

New restroom/shower facility behind the visitor contact station (either attached or a separate structure)	Requires SHPO/ACHP review
Removal and relandscaping of parking lot behind visitor contact station for use as a picnic area	Requires SHPO/ACHP review
Forrester warehouse ghost	Requires SHPO/ACHP review
Rehabilitation of Central Wharf	Requires SHPO/ACHP review
Dredging around and between Central and Derby wharves	Requires SHPO/ACHP review
Minor stone repair/replacement and preservation of Hatch's Wharf	Does not require further SHPO/ACHP review
Hard-surfacing of Hatch's Wharf for use as a staging area	Requires SHPO/ACHP review
Minor stone repair/replacement and preservation of Derby Wharf	Does not require further SHPO/ACHP review
Construction of a new building on Derby Wharf and construction of several ghosted structures	Requires SHPO/ACHP review
Removal of nonhistoric wooden piers attached to Derby Wharf	Requires SHPO/ACHP review
Modification of Derby Wharf to allow docking of a reconstructed vessel	Requires SHPO/ACHP review
Construction of a building for use in the dory construction exhibit	Requires SHPO/ACHP review

Resurfacing of Derby Street with cobblestones	Requires SHPO/ACHP review
Removal of parking from Derby Street	Does not require further SHPO/ACHP review
Undergrounding of power lines along Derby Street	Does not require further SHPO/ACHP review
Construction of a maintenance facility at the Blaney Street or Essex Street site	Requires SHPO/ACHP review

Alternative 3

Removal of the parking lot behind the visitor contact station and relandscaping for use as a picnic area	Requires SHPO/ACHP review
Rehabilitation of Central Wharf	Requires SHPO/ACHP review
Minor stone repair/replacement and preservation of Hatch's Wharf	Does not require further SHPO/ACHP review
Minor stone repair/replacement and preservation of Derby Wharf	Does not require further SHPO/ACHP review
Removal of nonhistoric wooden piers attached to Derby Wharf	Requires SHPO/ACHP review
Installation of large wayside exhibits on Derby Wharf	Does not require further SHPO/ACHP review
Installation of large wayside exhibits on the area between Derby Street and the beach	Does not require further SHPO/ACHP review
Removal of parking along Derby Street	Does not require further SHPO/ACHP review
Undergrounding of power lines along Derby Street	Does not require further SHPO/ACHP review
Construction of a maintenance facility at the Blaney Street or Essex Street site	Requires SHPO/ACHP review

Alternative 4

New restroom/shower facility	Requires SHPO/ACHP review
Rehabilitation of Central Wharf	Requires SHPO/ACHP review
Minor stone repair/replacement and preservation of Hatch's Wharf	Does not require further SHPO/ACHP review

Minor stone repair/replacement and preservation of Derby Wharf	Does not require further SHPO/ACHP review
Rehabilitation of the existing nonhistoric wooden piers attached to Derby Wharf	Does not require further SHPO/ACHP review
Modification of Derby Wharf to allow docking of vessels and access for the handicapped	Requires SHPO/ACHP review
Construction of a visitor contact/museum facility on Derby Wharf	Requires SHPO/ACHP review
Resurfacing of Derby Street with granite paving stones	Requires SHPO/ACHP review
Undergrounding of power lines along Derby Street	Does not require further SHPO/ACHP review
Removal of parking from Derby Street	Does not require further SHPO/ACHP review
Construction of a maintenance facility at the Blaney Street or Essex Street site	Requires SHPO/ACHP review

BIBLIOGRAPHY

BRUCE CAMPBELL AND ASSOCIATES

1990a *The Salem Transportation Plan.* Prepared under contract for the National Park Service. Boston, Mass.

1990b "Technical Memorandum: Salem Maritime NHS Parking and Circulation Analysis." Prepared under contract for the National Park Service. Boston Mass.

CAMP, DRESSER AND MCKEE INC.

1990 *Draft Interim Site Screening Study.* Vol. 1. Prepared for the South Essex Sewerage District, Salem Mass.

1987 *Draft Facilities Plan for Wastewater Treatment and Disposal, Phase One.* Vols. 1 and 2. Boston, Mass.

ENESCO, INC.

1987a *Chemical and Physical Evaluation of Dredged Material from the Fred J. Dion Yacht Yard in Salem, Massachusetts.* Marblehead, Mass.

1987b *Ecological Evaluation of Proposed Oceanic Discharge of Dredged Material from Salem Harbor, Salem, Massachusetts at the Fred J. Dion Yacht Yard.* Marblehead, Mass.

FEDERAL EMERGENCY MANAGEMENT AGENCY

1985a *Flood Insurance Rate Maps, City of Salem.*

1985b *Flood Insurance Study, City of Salem.*

HORVATH, STEVEN M., JR.

1975 "Salvage Archeology Off Central Wharf, Salem Maritime National Historic Site." Brown University, Providence, Rhode Island.

JASON M. CORTELL AND ASSOCIATES

1990 *Environmental Site Investigation.* Vol. 2 of Lane, Frenchman and Associates. *Existing Conditions and Dredging Feasibility Report for the Historic Wharves, Salem Maritime NHS.* Prepared under contract for the National Park Service.

LANE, FRENCHMAN AND ASSOCIATES

1990 *Existing Conditions and Dredging Feasibility Report for the Historic Wharves, Salem Maritime NHS.* Prepared under contract for the National Park Service.

LOUIS BERGER AND ASSOCIATES, INC.

1990a *A Geophysical Survey at the Salem Maritime National Historic Site,* by Bruce Bevan. Prepared under contract for the National Park Service.

1990b *Salem Maritime National Historic Site Historical Research, 1626-1990,* by Amy Friedlander. Prepared under contract for the National Park Service.

1990c *Underwater Archeological Remote Sensing Survey,* by J. Lee Co, Jr. Prepared under contract for the National Park Service.

1990d "Archeological Testing at Salem Maritime National Historic Site." In preparation. Prepared under contract for the National Park Service.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF AIR QUALITY

1989 *Ozone Air Quality Data Summary 1980-1989.* Boston, Mass.

1987 *Electric Power Generation Plants Criteria Pollutant Reports for NO_2, CO, SO_2: 1980-1987 Summary.* Boston, Mass.

1986 *Air Quality Reports, 1986-1988.* Boston, Mass.

MASSACHUSETTS DIVISION OF MARINE FISHERIES

1981 *Lab Manual For Identification of Ichthyoplankton from the Beverly-Salem Harbor Area,* by Elaine M. Elliott and Doris Jimenez. Salem, Mass.

1979 *Ichthyoplankton Abundance and Distribution in Beverly-Salem Harbor, March 1975-February 1977*, by Elaine M. Elliott, Doris Jimenez, Charles O. Anderson, Jr., and David J. Brown.

1977 *Investigations of the Effects of Electrical Power Generation on Marine Resources in Salem Harbor*, by Charles O. Anderson, Jr., David J. Brown, Elaine M. Elliott, and Doris Jimenez. Salem, Mass.

1975 *The Effects of the Addition of a Fourth Generating Unit at the Salem Harbor Electric Generating Station on the Marine Ecosystem of Salem Harbor*, by Charles O. Anderson, David J. Brown, Barry A. Ketschke, Elaine M. Elliott, and Patricia L. Rule. Salem, Mass.

1967 *A Study of the Marine Resources of Beverly-Salem Harbor*, by William C. Jerome, Jr., Arthur P. Chesmore, and Charles O. Anderson, Jr.

MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

1978 *Coastal Zone Management Program and Final EIS*. Boston, Mass.

MORAN, GEOFFREY P., EDWARD F. ZIMMER, AND ANNE E. YENTSCH

1982a "Archeological Investigations at the Narbonne House, Salem Maritime National Historic Site, Massachusetts." Prepared under contract for the National Park Service.

MROZOWSKI, STEPHEN A., LESLIE SHAW, MARTHA HOLLAND, AND JANET M. ZISK

1988 "An Archaeological Survey of the City." Prepared for the city of Salem, Massachusetts. Typescript on file at the National Park Service, Denver Service Center.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

1989 Nautical Chart, Salem, Marblehead, Beverly Harbors.

1988 *National Status and Trends Program for Marine Environmental Quality. Progress Report: A Summary of Selected Data on Chemical Contaminants in Sediments Collected During 1984, 1985, 1986, 1987*. Rockville, Maryland.

1987 *National Status and Trends Program for Marine Environmental Quality: A Summary of Selected Data on Chemical Contaminants Collected During 1984, 1985, 1986*.

NATIONAL PARK SERVICE, U.S. DEPARTMENT OF THE INTERIOR

1990 "Archeological Background Data, Salem," by Dana Linck. Ms. on file at Denver Service Center, Denver, Colorado.

1989 *Wetland Regulatory Compliance: A Guidance Manual for the National Park Service Mid-Atlantic Region*. Water Resources Division.

1988a *Management Polices*. Washington, D.C.

1988b *Statistical Abstract*. Denver Service Center.

1987 *Salem: Maritime Salem in the Age of Sail*. Handbook 126, Division of Publications, Harpers Ferry Center.

1982 *Historic Structure Report: Derby Wharf, Architectural Data, Salem Maritime National Historic Site, Massachusetts*, by Mary Jane Brady and Merrill Wilson. Denver Service Center.

1980 *Historic Structure Report: Central Wharf, Architectural and Archeological Data, Salem Maritime National Historic Site, Massachusetts*," by Merrill Ann Wilson and Geoffrey P. Moran. Denver Service Center.

1978 *Master Plan, Salem Maritime National Historic Site*. Denver Service Center.

1977 Historical Base Maps: The Salem Waterfront 1764-1819, Salem Maritime National Historic Site, Massachusetts, by Charles W. Snell. Denver Service Center.

1974a *Historic Structure Report: Derby Wharf and Warehouses, Historical Data, Salem Maritime National Historic Site, Massachusetts*, by Charles W. Snell. Denver Service Center.

1974b *Historic Structure Report: Ingersoll/Forrester/Central Wharf Historical Data, Salem Maritime National Historic Site, Massachusetts*, by Charles W. Snell. Denver Service Center.

1974c *Historic Furnishings Study: Derby Wharf Warehouses, Salem Maritime National Historic Site, Massachusetts*, by Charles W. Snell. Denver Service Center.

SALEM PARTNERSHIP, STRATEGIC PLANNING COMMITTEE

1988 *Draft Salem Partnership Strategic Plan*. Salem, Mass.

SALEM STATE COLLEGE

1990 *Salem Visitor Use Study*. Prepared under contract for the National Park Service. Salem, Mass.

TAMS CONSULTANTS, INC.

1990 *Condition Survey and Engineering Evaluation*. Vol. 1 of Lane, Frenchman and Associates. *Existing Conditions and Dredging Feasibility Report for the Historic Wharves, Salem Maritime NHS*. Prepared under contract for the National Park Service.

U.S. ARMY CORPS OF ENGINEERS

1986 *Rivers and Harbors Project Maps*. Vol. 2. Waltham, Mass.

1975 *Addition of Unit Number 5, Salem Harbor Generating Station Draft Environmental Statement*. Waltham, Mass.

U.S. DEPARTMENT OF ENERGY

1982 *Conversion to Coal, New England Power Company, Salem Harbor Generating Station Units 1,2,3*. Salem, Mass.

U.S. FISH AND WILDLIFE SERVICE

1988 *National List of Plant Species That Occur in Wetlands: Massachusetts*, by Porter B. Reed, Jr. St. Petersburg, Florida.

1979 *Classification of Wetlands and Deepwater Habitats of the U.S.*, by Lewis M. Cowardin, Virginia Carter, Francis C. Golet, and Edward T. LaRoe.

U.S. SOIL CONSERVATION SERVICE

1984 *Soil Survey of Essex County, Massachusetts*.

STUDY TEAM, CONSULTANTS, AND CONTACTS

STUDY TEAM

The Denver Service Center in conjunction
with the North Atlantic Regional Office

CONSULTANTS

Bruce Campbell and Associates, Inc., Boston,
Mass.

Lane, Frenchman and Associates, Inc.,
Architects and Planners, Boston,
Massachusetts
- Subconsultants:
  - TAMS Consultants, Inc.
  - Jason M. Cortell and Associates, Inc.
  - McGinley Hart and Associates, Inc.

Louis Berger and Associates, Inc., East
Orange, New Jersey

Obermeier, Bershof, Goss, Ziegel, Inc.,
Denver, Co.
- Subconsultants:
  - DHM and Associates, Inc.

CONTACTS

Federal
- Advisory Council on Historic Preservation
- Environmental Protection Agency
- Federal Emergency Management Agency
- National Oceanic and Atmospheric Administration
  - Marine Fisheries Service
- U.S. Department of Defense
  - Army Corps of Engineers, New England Division
- U.S. Department of the Interior
  - Fish and Wildlife Service
- U.S. Department of Transportation
  - Coast Guard

State
- Massachusetts Coastal Zone Management
- Massachusetts Department of Environmental Protection
- Massachusetts Division of Marine Fisheries
- Massachusetts Environmental Policy Act Unit
- Massachusetts Historic Preservation Office
- Massachusetts Natural Heritage Program

Other
- Brookhouse Home
- Museum Collaborative
- New England Power Company
- New Pickering Wharf Corporation
- Salem Board of Health
- Salem City Council
- Salem Conservation Commission
- Salem Harbormaster
- Salem Historical Commission
- Salem Partnership and the Waterfront Committee
- Salem Planning Department
- Salem Trolley Corporation
- Shetland Properties
- South Essex Sewerage District

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

Publication services were provided by the graphics and editorial staffs of the Denver Service Center.
NPS D-43 April 1991

☆ U.S. GOVERNMENT PRINTING OFFICE: 1991—573-040/20,040 REGION NO. 8

END

FILMED

08 / 14 / 92